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Theme: Medicine utilisation research in Africa influencing patient care and policy

Aggregated Abstracts

Topics

Section	Page numbers
Oral Presentations – Invited including workshops	**4 - 10**
Oral Presentations – All	**12 - 20**
Poster Presentations - All	**22 - 35**

Oral Presentations invited (including workshop abstracts)

Validity of WHO/INRUD prescribing indicators in Namibia's primary health care: findings and implications

N QAMAR1, B GODMAN2,3, A MASSELE4, S CAMPBELL5,6, A BAKER3, HR KAGOYA7, AND D KIBUULE1
Email of submitting author: qniaz@unam.na

1School of Pharmacy, Faculty of Health Sciences, University of Namibia, Namibia
2Division of Clinical Pharmacology, Karolinska Institute, Stockholm, Sweden
3Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK
4School of Medicine, University of Botswana, Gaborone, Botswana
5Centre for Primary Care, University of Manchester, UK and
6NIHR Greater Manchester Primary Care Patient Safety Translational Research Centre, Manchester, UK
7Management Sciences for Health, Windhoek, Namibia

Background: WHO/INRUD indicators are widely used across Africa to identify medicine use. However, there is limited evidence on their validity and use in Namibia's primary health care (PHC).

Objectives: Consequently, our objective was to undertake research in Namibia to validate the use of WHO/ INRUD criteria in assessing the quality of prescribing in ambulatory (PHC) care

Methods: An analytical cross-sectional survey design. The validity of the WHO/INRUD indicators was determined using two-by-two tables against compliance to the Namibian standard treatment guidelines (NSTG). The receiver operator characteristics for the WHO/INRUD indicators were plotted to determine their accuracy as predictors of compliance to standard prescribing guidelines. A multivariate logistic model was constructed to independently determine the prediction of each indicator.

Results: Out of 1243 prescriptions; compliance to NSTG prescribing was sub-optimal (<80%). Three of the four WHO/INRUD indicators did not meet national and WHO thresholds. These were antibiotic prescribing, average number of medicines per prescription and prescribing by generic (INN) name. The majority of the WHO/INRUD indicators had low sensitivity and/or specificity, i.e. antibiotics prescribing (53.3%, 17.9%: AUC= 0.0.64, $p < 0.001$); polypharmacy (72.3%, 34.5%: AUC= 0.0.46, p=0.019); injection prescribing (11.6%, 91.4%: AUC= 0.48, $p = 0.137$); and generic prescribing (38.2%, 67.6%: AUC= 0.51, p=0.6). All WHO/INRUD indicators had poor accuracy in predicting rational prescribing. The antibiotic prescribing indicator was the only covariate as a significant independent risk factor for compliance to NSTG prescribing.

Conclusions: WHO/INRUD indicators showed poor accuracy in assessing prescribing practices in PHCs in Namibia. There is a need for appropriate models and/or criteria to optimize medicine use assessments in PHCs in the future. This includes the development of pertinent quality indicators for the local situation.

Assessment of prescribing practices at Primary Health Care facilities in Botswana with emphasis on antibiotics; findings and implications

Y MASHALLA1, V SETLHARE1, E SEPAKO1, A MASSELE1, M CHUMA1, J KGATLWANE1, C TIROYAKGOSI 2, AND B GODMAN3,4. **Email of submitting author:** Yohana.mashalla@mopipi.ub.bw

1University of Botswana, Faculty of Medicine Gaborone, Botswana
2Ministry of Health, Botswana
3Division of Clinical Pharmacology, Karolinska Institute, Stockholm, Sweden
4 Strathclyde Institute of Pharmacy and Biomedical Sciences, Strathclyde University, Glasgow, UK

Background: Inappropriate drug prescribing has increased in the past decade, especially in developing countries. This includes antibiotics especially for respiratory tract infections. The evidence base suggests that bacterial resistance to antibiotics is directly related to high and inappropriate use of antibiotics used in the community.

Objectives: This study aimed to assess antibiotic prescribing patterns at urban primary health care (PHC) facilities in three districts in Botswana to provide future guidance including developing new QIs.

Methods: Retrospective data from patient's records (January – December 2013) in 19 clinics was collected using the WHO/DAP (1993) indicator guidelines in a cross-sectional study between January –December 2013. Crude prescribing rates were assessed against WHO/ INRUD criteria and the quality of antibiotic prescribing were assessed against the Botswana Essential Drug List and the Botswana Treatment Guidelines 2012. In addition, against LMIC countries in Europe/ former Soviet Union.

Results: The average number of drugs per prescription is 2.8; 78.6% of the drugs prescribed were in International Non-proprietary Names and 96.1% are on the list of Essential Drugs. Overall rate of antibiotic prescription is high (42.7% of encounters) with 14.7%, 5.9% and 1.3% prescriptions having two, three and four antibiotics prescribed respectively. The figures are higher than WHO recommendations and may reflect higher prevalence of gynaecological infections and STIs. Encouraging are high rate of compliance with EML (96.1%), high INN prescribing (78.6%) and low use of co-amoxiclav and fluoroquinolones. Low rate of cephalosporin utilisation, similar to other countries.

Conclusions: More national wide studies are needed to determine the extent of inappropriate prescribing practices and non-compliance to the National Standard Treatment Guidelines in Botswana. The findings can be used to develop appropriate quality indicators for PHCs in Botswana and wider.

Use of medicine and chronic disease list conditions as proxy for comorbidity among children and adolescents with ADHD in the Western Cape

J BURGER[1], L JOUBERT[1], I TRUTER[2], AND M LUBBE[1]
Email of submitting author: Johanita.Burger@nwu.ac.za

[1]*Medicine Usage in South Africa (MUSA), North-West University, Potchefstroom, SA.*
[2]*Drug Utilisation Research Unit (DURU), Nelson Mandela Metropolitan University, Port Elizabeth, SA*

Background: **A**ttention-Deficit/Hyperactivity Disorder (ADHD) co-occurs with a variety of comorbid and coexisting conditions. There is little information available about the prevalence of these conditions in children with ADHD. Claims data often lack diagnostic information, limiting use of these data in research.

Objectives: To determine comorbidity among children and adolescents with ADHD in the Western Cape, South Africa using the prevalence of medicine (pharmacological classes) prescribed and chronic disease list (CDL) conditions as proxy.

Methods: A retrospective, cross-sectional study was conducted on medicine claims data from 1 January 2005 to 31 December 2013 for a total of 2516 children 18 years or younger with ADHD. CDL conditions were identified by using ICD-10 codes on claims reimbursed from prescribed minimum benefits. The pharmacological classes of medicine received at least once during the study period were identified using the MIMS classification system. Data were analysed descriptively.

Results: A total of 93 (3.70%) patients had CDL conditions. 70.2% (n=90) of these children presented with one CDL condition. Asthma was most prevalent, occurring in 96.77% (n=69) of patients, followed by epilepsy with 17.20% (n=16). A combination of asthma and epilepsy was found in three patients (3.13%). Other CDL conditions included type 1 diabetes mellitus (1.08%, n=1), hypothyroidism (1.08%, n=1), and multiple sclerosis (3.23%, n=3). A total of 1691 patients (67.21%) received other drugs at least once during the study period. The most prevalent pharmacological classes were antimicrobials (54.82%, n=927), respiratory system agents (10.00%, n=169), dermatologicals (6.68%, n=113), central nervous system agents (6.15%, n=104), ear, nose and throat medicine (4.97%, n=84), autacoids (3.49%, n=59), analgesics (2.72%, n=46), as well as endocrine system agents (2.54%, n=43).

*Conclusion***:** This study provided valuable information about comorbidities in children and adolescents with ADHD in the Western Cape using medicine prescribing patterns and CDL conditions as proxy for diagnosis.

The European experience with managed entry and risk-sharing agreements and their applicability in Africa

A FERRARIO[1] AND B GODMAN[2,3]
Email of submitting author: a.ferrario@lse.ac.uk

[1]*LSE Health, London School of Economics and Political Science, UK (until 15 April 2017), Harvard Medical School, USA (from 17 July 2017)*
[2]*Karolinska Institute, Stockholm, Sweden*
[3]*Strathclyde Institute for Pharmacy and Biomedical Sciences, Glasgow, UK*

Background: Managed entry agreements (MEAs) are a set of instruments to facilitate access to new medicines, in a context of uncertainty (e.g. effectiveness, uptake), high prices and unmet medical need. Their use is relatively well established in a number of OECD countries.

Objectives: To present the European experience with MEAs, in particular their sustainability in facilitating access and their applicability in Africa.

Methods: Two surveys of competent authorities were conducted covering different geographical areas of Europe.

Results: Across the five Central and Eastern European countries with available data, the most common MEAs were confidential discounts (n=806, 81%), followed by price-volume agreements (n=37, 4%), free doses (n=25, 2%), bundle and other agreements (n=19, 2%), and payment by result (n=10, 1%). Most trade names associated with one or more MEA instruments were antineoplastic and immunomodulating agents (n=201, 31%). The second most frequent therapeutic group for MEA implementation was alimentary tract and metabolism (n=87, 13%), followed by medicines for neurological conditions (n=83, 13%). The situation was similar in Western Europe in terms of types of agreements and therapeutic focus.

Conclusions: The European experience suggests that citizens, authorities and pharmaceutical companies should be more critical towards the confidentiality nature of these agreements and whether confidential prices should continue to be tolerated within public health systems. Even more so given the lack of clarity around which country and party they are really benefitting from these agreements. Authorities in African countries should adopt similar caution as they may be proposed similar agreements as a way to increase universal access to existing and new medicines. They may consider adopting some discount agreements as a short-term solution to improve access to medicines. However, in parallel, they need to work with other countries to find a global solution to ensure sustainable patient access to affordable cost-effective medicines.

Good Practices of Drug Utilization Studies in Countries from the LatAm and African Regions

M SALAS1, L C LOPES2, B GODMAN3,4, I TRUTER5, J FADARE6, D GALICIA7, MN OLUKA8, K APPENTENG9, BURGER J10, D ANKRAH11,12, O OGUNLEYE13, J BIDONDE 14,15
Email of submitting author: Maribel.salas@merck.com

1Merck Research Laboratories & Adjunct Scholar, University of Pennsylvania
2Universidade de Sorocaba – UNISO Universidade Estadual Paulista " Júlio de Mesquista Filho" – UNESP São Paulo, Brasil
3Division of Clinical Pharmacolgy, KI, Sweden
4Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow UK; Health Economics Centre, Liverpool University, UK;
5Drug Utilization Research Unit (DURU), Nelson Mandela Metropolitan University, South Africa
6Departments of Pharmacology and Therapeutics/Medicine, Ekiti State University/Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria
7Faculty of Pharmacy, Universidad de Morelos, Mexico
8Department of Pharmacology and Pharmacognosy, School of Pharmacy, University of Nairobi
9Epidemiology, Astellas Pharma US; Donneyong M - Department of Pharmacy Practice and Science, College of Pharmacy, The Ohio State University, Columbus OH
10Faculty of Health Sciences, North-West University (Potchefstroom campus), Potchefstroom, South Africa
11Department of pharmacoepidemiology and pharmacology, Utrecht University, Netherlands
12Korle-Bu Teaching Hospital, Ghana;
13Departments of Pharmacology/Therapeutics and Medicine, University College of Medicine and Lagos State University Teaching Hospital, Ikeja, Lagos, Nigeria
14National Institute of Public Health. Folkehelseinstituttet. Health Technology Assessment Unit, Seksjon for legemidler og helseøkonomi.
15Affiliated member School of Physical Therapy, U of S, Canada; Herrera-Comoglio R - Servicio de Farmacovigilancia, Facultad de Ciencias Médicas, Universidad Nacional de Córdoba.

Background: Drug utilization (DU) research has improved notably in the last decades, moving from descriptive studies to quantitative studies with the inclusion of drug use quality indicators, and indicators of the quality of the health care system. However, the advancements have not been universal, and some regions such as the Latin America (LatAm) and African regions have faced particular challenges.

Objectives: To develop the guidance on Good Practices of DU in the LatAm and African regions to plan, conduct and evaluate DU research with the final goal of improving the rational use of medicines.

Methods: A group of researchers interested in DU unpacked in an on-going project the main challenges and possible solutions to carry out DU research for the LatAm and African Regions, which will be disseminated through a guidance document. The guidance will include the following sections: general considerations, rationale, issues and challenges, sources of information, validity, reliability and quality, challenges and opportunities in validity and reliability, type of research questions, analysis of quantitative and qualitative research, discussion and final recommendations. The initial analysis of the Latin America and African regions identified inconsistency in DU methodology that precludes cross-national comparisons. The guidance will attempt to establish consistency to conduct DU research; assessment of the quality of the data (reliable and valid data, particularly the robustness of the denominator); and analysis of the DU data itself. The guidance will also take into account specific challenges from these regions, and high variability in the local personnel trained in DU.

Expected Outcomes: It is expected that the guidance will contribute improving DU research in the two regions, which should impact positively on the rational use of medications and ultimately on the outcomes of the health care systems in the LatAm and African regions.

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The first point-prevalence survey in different hospital settings in Zimbabwe.

S MTAPURI-ZINYOWERA1, N MADZIKWA1, M NDHLOVU1, B CHAIBVA1, R HOVE1, V ROBERTSON2
Email of submitting author: zinyowerasekesai@gmail.com

1Directorate of Pharmacy Services, Ministry of Health and Child Care, Zimbabwe
2University of Zimbabwe, Zimbabwe

Background: At the 68th World Health Assembly in 2015, Member States were urged to have in place national action plans (NAP) on strategies to manage antimicrobial resistance (AMR) in line with the Global Action Plan. In this regard Zimbabwe conducted a situational analysis which included a point-prevalence survey on antibiotic use.

Objective: To determine what factors influence the type of antibiotic prescription in different hospital settings.

Methods: A point prevalence survey was conducted from December 2016 to January 2017 in 18 health institutions *i.e.* 5 central hospitals, 7 provincial hospitals, 2 district hospitals, 2 infectious disease hospitals, and 2 private hospitals using a tool designed by the Medicines Utilisation Research group in Africa group. In-patient medical records were collected for all patients that had been admitted into a ward before 7 am on the day of the survey and had received an antibiotic prescription.

Results: In total, 810 records were included in the analysis and 1523 antibiotics were prescribed. The most prescribed antibiotic being ceftriaxone injection 406 (27%) followed by benzylpenicillin injection 189 (12.4%), metronidazole (parenteral) 140 (9%), gentamicin 139 (9%), and cloxacillin 103 (6.8%). Ceftriaxone was used mainly in Central, Provincial and Private hospitals and benzylpenicillin in District and Infectious disease hospitals. Both antibiotics were supplied from the central medical stores and medical doctors were the most frequent prescribers. Ceftriaxone was used for all indications but mostly in medical wards for central nervous system infections (63.5%). Culture and sensitivity tests were undertaken for only 7.8% of the patients.

Conclusions: The most common drug was ceftriaxone depending on the supply chain and also the prescriber, hence the need for strengthening stewardship programs through the establishment of hospital medicines therapeutic committees in all hospitals.

Point prevalence survey of antimicrobial utilisation in an academic hospital in the Gauteng province, South Africa

N SCHELLACK1, N DLAMINI1, JC MEYER1, AND B GODMAN2,3
Email of submitting author: natalie.schellack@smu.ac.za

1School of Pharmacy, Sefako Makgatho Health Sciences University, South Africa
2Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK;
3Division of Clinical Pharmacology, Karolinska Institutet, Stockholm, Sweden.

Background: Antimicrobial resistance (AMR) is a serious health concern and directly threatening patient safety. There is a paucity of data pertaining to antimicrobial utilisation and consumption in the world and similar in South Africa (SA).

Objectives: This study aimed to determine antimicrobial consumption in a hospital in SA using a point prevalence survey (PPS) as a basis for future PPS studies.

Methods: A PPS was conducted in Dr George Mukhari academic hospital using a paper based data collection instruments previously used in Botswana. Data were collected by trained data collectors over a period of three weeks. The sample comprised all inpatients in a ward at 08h00 on the day of the survey. All inpatient files of the 39 wards were completely surveyed in a single day. The total number of patients in the respective ward served as the denominator, and the number of patients on antimicrobials the numerator.

Results: Preliminary results from 15 of the 39 wards (paediatric and adult medicine) showed that females predominated (59.1%). Just less than half (47.3%) of the patients were on antimicrobials, of whom 37.5% were previously hospitalised and 29.8% used antimicrobials in the last 90 days. A total of 155 antimicrobials were prescribed, of which 48.4% were prescribed before requesting a culture sensitivity test. Meropenem and amikacin were the most used antibiotics in the paediatric wards (n=24) and ceftriaxone was the most prescribed antibiotic in the adult medical ward (n=30).

Conclusions: Determining antimicrobial consumption data in low resource settings remains a challenge. The PPS method offers a standardized tool to identify targets for quality improvement. South Africa is well placed to contribute to the growing knowledge based on antibiotic use and create a platform to increase collaboration and initiate regular documentation and measurement of robust data of antimicrobial consumption.

Antibiotic Utilization Studies Using Point Prevalence Survey in Botswana

BDA PARAMADHAS1, J KGATLWANE2, C TIROYAKGOSI3, M MATOME4, A MASSELE2, B GODMAN5,6, J ERIKSEN5, AND LL GUSTAFSSON5
Email of submitting author: anandbene@yahoo.com

1Chief Pharmacist, Nyangabgwe Hospital, Francistown, Botswana.
2University of Botswana;
3Ministry of Health, Botswana;
4AFA Botswana;
5Karonlinska Institute, Stockholm, Sweden
6Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK;

Background: Bacterial resistance to antibiotics is a recognized emerging public health problem and a burden for most health systems that threatens the achieved health gains of countries. Inappropriate and indiscriminate use of antibiotics is the major factor that promotes evolution of bacterial resistance. The extent and appropriateness in the utilization of antibiotics in Botswana remains unknown.

Objectives: To describe the extent and appropriateness of antibiotic use in hospitalized patients using Point Prevalence Surveys (PPS) and assess the structural capacity for promotion of their appropriate use in hospitals.

Methods: Observational descriptive study design with structured hospital, ward and patient level variables in 10 public hospitals in Botswana representing all geographical regions of the country. A structured questionnaire was also used to assess the institutional capacity for promotion of appropriate antibiotic use.

Results: The preliminary findings from the completed study sites with demographic details, risk factors for infections including previous antibiotic use, prescribing patterns in various wards; patient and diagnostic groups on antibiotics; their appropriateness to diagnosis, missed doses, frequencies of culture and sensitivity testing and the rates of isolated bacteria will be discussed. The assessed institutional capacity to promote appropriate antibiotic use will also be presented. In addition, frequencies of categorical variables will be presented in percentages and continuous variables in means with SD or median with IQR.

Conclusions: Point Prevalence surveys provide a snap-short of the extent to which antibiotics are used and their appropriateness in countries where aggregate longitudinal data is unavailable. It is less resource intensive and may be cost effective to support the development of an informed national action plan.

An audit of aminoglycosides use in the paediatric wards of a tertiary hospital in Kenya

E ONYANGO1, F OKALEBO1, M OLUKA1, R KINUTHIA2 AND B GODMAN3,4
Email of submitting author: elias_onyango@yahoo.com

1Department of Pharmacology and Pharmacognosy, School of Pharmacy, University of Nairobi, Nairobi, Kenya
2Kenyatta National Hospital, Nairobi, Kenya
3Strathclyde Institute of Pharmacy and Biomedical Sciences, Strathclyde University, Glasgow, UK.
4Division of Clinical Pharmacology, Karolinska Institutet, Stockholm, Sweden

Background and Objectives: Aminoglycosides are high risk medicines. Gentamicin and amikacin are the most commonly used aminoglycosides at the Kenyatta National Hospital (KNH) in Kenya. The use of aminoglycosides normally requires monitoring, but to date, no clinical audit has been undertaken to assess compliance to guidelines. KNH currently lacks protocols for therapeutic drug monitoring (TDM) particularly in the paediatric wards where there is high utilization of aminoglycosides.

Methods: A prospective cohort study to audit the general pediatric ward and the new born unit of KNH between October 2016 and March 2017 using a mixed method approach. Quantitative data collected by review of patient files. Semi-structured interviews used to collect data from healthcare workers on current knowledge, attitudes and barriers towards effective implementation of TDM of aminoglycosides.

Preliminary Results: A total of 194 paediatric patients, predominantly aged one month and below were recruited. Overall prevalence of aminoglycoside use was 8.3% with the new born unit having the highest prevalence (16.2%). The majority of children had neonatal sepsis as the main indication for aminoglycosides. Prescribed gentamicin dose per body weight for the neonates<7 days old weighing <2kg was significantly higher than the recommended 3mg/kg dose (p= 0.0064). Prescribed amikacin dose per body weight was not significantly different from 15mg/kg (p =0.5516) recommendations. Adverse drug reactions were suspected in 65 patients (33.9%) with fever being the most common. There was one case each of nephrotoxicity and rash. Baseline creatinine levels were documented in the majority of the cases but there was no evidence of TDM for the aminoglycosides. Further data analysis is on-going including qualitative aspects.

Preliminary Conclusions: Almost 20% of neonates were exposed to aminoglycosides with doses for the most vulnerable not conforming to national Pediatric Protocols. Inadequate monitoring of paediatric patients on aminoglycosides is a matter of concern that requires attention.

Meropenem use evaluation at Kenyatta National hospital

MARGARET OLUKA[1] PM KIVOTO[1], L ACHIENG[2]
Email of submitting author: olukamarga@yahoo.com

[1]University of Nairobi School of Pharmacy, Nairobi, Kenya
[2]University of Nairobi School of Medicine, Department of Medicine, Nairobi. Kenya

Background: Antimicrobial resistance is a growing challenge in resource limited settings and is largely driven by antibiotic use. Infections caused by resistant bacteria are more expensive to treat and are associated with a higher morbidity and mortality. Carbapenems have recently become available at the Kenyatta National Hospital (KNH) with few practice guidelines available on their use.

Objectives: We set out to evaluate the use of Meropenem in the inpatient setting at KNH.

Methods: This was a retrospective chart review of all patients who had a meropenem prescription in the months of February to May 2016. Data extracted from charts included patient characteristics and diagnosis at the time of prescription. We also extracted data that was used to fill a ten point tool for evaluation of meropenem utilisation that included: Justification for the prescription, prescription of the drug, appropriate initial dose, appropriate maintenance dose, patient review by a senior doctor, absence of contraindications, no potential drug-drug interactions, presence of culture and sensitivity results in the patient file, no adverse reactions in the course of treatment and whether clinical improvement was documented in the patient files. We used a preset threshold of 95% for each criteria. Meropenem use was considered appropriate if 95% of the charts reviewed met the criteria.

Results: We reviewed 111 patient charts, 53% of the patients were male and 38.7% were below 18 years of age. The commonest diagnosis at time of meropenem prescription was sepsis (26.1%), followed by meningitis (17.1%), pneumonia (15.3%) and urinary tract infections (5.4%). Only 3 criteria met the pre-set threshold of 95%, these were the right prescriber initiating treatment, patient review by a senior doctor, and a lack of adverse drug reactions in the course of treatment. Some of the criteria performed poorly. Culture and sensitivity results were present in only 38.7% of the charts, assessment for clinical improvement was documented in 41.44% and potential drug-drug interactions in only 47.75%. Initial and maintenance doses were appropriate in 70.3% of the cases

Conclusions: In this drug use evaluation, meropenem use was not appropriate in the majority of the patients. Prescriber education and use of standard guidelines should be implemented in this setting.

The current state of antimicrobial stewardship programs in Nigerian tertiary healthcare facilities

FADARE J1, OLAYINKA OGUNLEYE2, ARNO MULLER3, GARBA ILIYASU4, OKEZIE ENWERE5 AND B GODMAN6,7,8
Email of submitting author: joseph.fadare@eksu.edu.ng

1Department of Pharmacology and Therapeutics, College of Medicine, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria
2Departments of Pharmacology and Medicine, Lagos State University College of Medicine and Teaching Hospital Ikeja, Lagos, Nigeria
3Essential Medicines & Health Products
World Health Organization, Geneva
4Infectious Diseases Unit, Department of Medicine, Bayero University, Kano, Nigeria
5Department of Medicine, Imo State University, Orlu, Imo State, Nigeria
6Division of Clinical Pharmacology, KI, Stockholm, Sweden; 7Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK and 8Health Economics, Liverpool University Management School, UK

Background: Antimicrobial resistance is a growing public health problem with consequences including increased morbidity and mortality as well as healthcare costs. Antimicrobial use is an important driver for resistance. Approaches to improve prescribing of antimicrobials include the implementation of antibiotic stewardship programs (ASP) in healthcare institutions. Many developed countries have well-entrenched antibiotic stewardship programs that have resulted in better patient outcomes and reduced healthcare costs. There is no information however about the availability of ASPs in Nigerian healthcare facilities; hence the rationale for this study.

Objectives: Investigate the availability and mode of operation of ASPs among selected tertiary healthcare facilities across different regions of Nigeria
Methods: Cross-sectional, questionnaire-based study conducted among selected tertiary-level hospitals across Nigeria. The instrument was developed by the Transatlantic Taskforce on Antimicrobial Resistance (TATFAR) Expert Panel on Stewardship Structure and Process Indicators. The questionnaires were emailed to focal persons in the respective institutions after initial contact was made by telephone.

Results: Completed questionnaires were received from 17 out of 25 tertiary healthcare facilities across five geo-political regions of the country. According to area of specialization, 10 (58.8%), 4(23.6%), 2(11.8%) and 1(5.8%) respondents are specialists in internal medicine, infectious diseases, medical microbiology and clinical pharmacology respectively. Only 6 (35.3%) healthcare facilities have

a formal organizational structure and a team responsible for ASP. Facility-specific treatment recommendations based on local antimicrobial resistance pattern were available in only 4 (23.5%) healthcare facilities. A policy on approval for prescription of specified antimicrobial agents by a physician or pharmacist, and a formal procedure for reviewing the appropriateness of an antimicrobial agent after 48 hours, was present in only 2 (11.8%) facilities. The cumulative antimicrobial susceptibility report for the previous year was available in only 3 (17.6%) facilities while results of antimicrobial audits were communicated to prescribers in only one facility. Only one facility monitors antimicrobial use by grams (Defined Daily Dose (DDD) or counts (Days of Therapy [DOT]) of antimicrobials per days.

Conclusions: This study reveals significant deficiencies in the infrastructural, policy and monitoring and feedback aspect of ASPs in tertiary healthcare facilities in Nigeria. There is an urgent need for the government and other stakeholders to address this problem to improve the rational use of antimicrobial agents in the country. Point prevalence surveys of antibiotic use in hospitals could be a good starting point by measure antibiotic prescribing habits. Strengthening of DTCs is also important.

Determinants of Antibiotic Prescriptions Among Doctors in a Nigerian Teaching Hospital

OLAYINKA OGUNLEYE1, ADESOLA YINKA-OGUNLEYE2
Email of submitting author: yinkabode@yaho.com

1Department of Pharmacology, Therapeutics and Toxicology and Lagos State University College of Medicine, Ikeja, Lagos, Nigeria
2Nigerian Center for Disease Control, Abuja, Nigeria

Background: The problem of antimicrobial drug resistances is highly prevalent in many parts of the world with overwhelming magnitude and implications in the resource poor nations. In Nigeria, the rising trend of antimicrobial resistances have been widely reported. Irrational uses of currently available agents constitutes major contributory factors to the problems of antimicrobial resistances. An understanding of the factors influencing antibiotics prescription among doctors will inform appropriate interventions.

Objectives: The study aimed at identifying the factors influencing the choices of antibiotics prescription among the doctors at the Lagos State University Teaching Hospital, Nigeria.

Methods: A cross sectional survey investigating the determinants of antibiotics prescription among doctors at the Lagos State University Teaching Hospital, Lagos, Nigeria. All doctors in attendance at a hospital ground round where the topic of rational uses of antimicrobial agents was presented by the lead researcher completed a structured questionnaire which obtained information on the socio demographic characteristics of the doctors and the factors determining their uses of antibiotics. Statistical tests were carried out with SPSS 15.0; continuous variables were expressed as means (standard deviation), categorical variables as proportions.

Results: 98 doctors (58% of the total number of doctors in the hospital at this period) participated with a mean age of 36.2(9.0) years, mean duration of practice of 10.7(9.3). Respondents cuts across various professional cadres and clinical subspecialties. Antibiotics were frequently prescribed by 97% of the respondents. The predominant factors determining prescriptions were information from pharmaceutical representatives (98.0%), clinical judgments (93.9%) and experiences (87.8%). The factors of laboratory reports and unit policy were less prominent (57.1% and 43.9% respectively). Only 8.2% admitted to the factor of hospital guidelines on antimicrobial therapy.

Conclusions: There is no evidence for existence of institutional policies regarding antimicrobial therapies. Factors of cost, drug availability and information from pharmaceutical representatives evidently influences drug uses. Measures to promote rational antimicrobial uses are urgently required in the population studied.

Selected Oral Presentations

Compliance to guidelines for the prescribing of antibiotics in acute infections at Namibia's national referral hospital: a pilot study and the implications

SONIA NAKWATUMBAH1, D. KIBUULE1, V. HAAKURIA1, F. KALEMEERA1, 3A. BAKER; 1M. MUBITA, B GODMAN2,3,4
Email of submitting author: sonia.miranda.polo@gmail.com

1Daculty of Health Sciences, School of Pharmacy, University of Namibia, Windhoek, Namibia
2Department of Laboratory Medicine, Division of Clinical Pharmacology, KI, Stockholm, Sweden; 3Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, UK, 4Liverpool Health Economics Centre, Liverpool University, UK

Background: Sub-optimal antibiotic prescribing remains a public health concern in Namibia. The objective was to determine the level and predictors of compliance to guidelines in the prescribing of antibiotics in acute infections at a national referral hospital in Namibia to improve future prescribing.

Methods: An analytical cross-sectional survey design. The clinical records of patients receiving care were reviewed. Prescribing practices were assessed using a self- administered questionnaire with reference to Namibia Standard Treatment Guidelines (NSTG).

Results: The majority of prescriptions (62%) complied with the NSTGs; however, lower than national targets (95%). Most prescriptions were empiric and prescribers typically made reference to the NSTG (58%). Diagnosed infections were principally respiratory infections (58%) and penicillins were the most used antibiotics. Good concurrence between signs and symptoms with the diagnosis indicated on the prescription - OR=5.2 (95% CI: 1.4, 19.2), a diagnosis of upper respiratory tract (p=0.001), oral-dental OR=0.1(95% CI: 0.03,0.3) and urogenital infections OR=0.3(95% CI: 0.1,0.95) and the prescribing of penicillins (p=0.001) or combination antibiotics and amphenicols were independent predictors of compliance to the NSTGs. The main behaviours associated with antibiotic prescribing were patient influences, clinical state, and access to guidelines.

Conclusions: Compliance with NSTGs is suboptimal. Prescribing of combination antibiotics, penicillins and diagnosis of oral dental, genitourinary and ear, nose and throat infections were important predictors for NSTG compliance. There is a need to implement antibiotic indicators and stewardship programmes, and ensure access to NSTGs, to improve future antibiotic prescribing in Namibia.

A situational analysis of current antimicrobial governance, regulation and utilisation in South Africa

NATALIE SCHELLACK1, DEON BENJAMIN2, ADRIAN BRINK3,4, ADRIANO DUSE5, KIM FAURE6, DEBRA GOFF7, JOHANNA MEYER1, MARC MENDELSON8, JACQUI MIOT9, OLGA PEROVIC10, TROY POPLE11, MORITZ VAN VUUREN12, SABIHA ESSACK13,
Email of submitting author: natalie.schellack@smu.ac.za

1School of Pharmacy, Sefako Makgatho Health Sciences University, South Africa (SA)
2Novagen, Pretoria, SA;
3Ampath National Laboratory Services, Milpark Hospital, Johannesburg, SA
4Division of Infectious Diseases & HIV Medicine, Department of Medicine, Groote Schuur Hospital, University of Cape Town, SA;
5School of Pathology of the NHLS & University of the Witwatersrand, Johannesburg, SA;
6 National Department of Health, SA;
7College of Pharmacy, The Ohio State University and The Ohio State University Medical Center, Columbus, Ohio USA;
8Division of Infectious Diseases & HIV Medicine, Department of Medicine, Groote Schuur Hospital, University of Cape Town, SA;
9Pharmacology Division, Faculty of Health Sciences, University of Witwatersrand, Johannesburg, SA;
10Centre for Opportunistic, Tropical and Hospital Infections, University of Witwatersrand, Johannesburg, SA;
11Sanofi Pasteur, Lyon, France; Fatima Suleman, Antimicrobial Research Unit, College of Health Sciences, University of KwaZulu-Natal, Durban, SA;
12Dept. of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, SA;
13Antimicrobial Research Unit, College of Health Sciences, University of KwaZulu-Natal, Durban, SA.

Background: The Global Action Plan (GAP) on antimicrobial resistance (AMR) calls for optimising the use of antimicrobial medicines in human and animal health, together with strengthening the knowledge and evidence base through surveillance and research. However, there is a paucity of consumption data in South Africa (SA) and determining antimicrobial consumption data in low resource settings remains a challenge.

Objectives: To assess antimicrobial consumption data in South Africa, aimed at providing a baseline scientific basis for future investigation and interventions to improve the use of antimicrobials in South Africa.

Methods: Alternative mechanisms such as Intercontinental Marketing Services (IMS), and contract data arising from tenders (an open Request for Proposal, RFP) was used to quantify utilisation. Four quantitative indicators, the total number of antimicrobial units (QTY units), total sum of the quantity of units per ATC class, moving annual total (MAT) Units and compound annual growth rate (CAGR) was used to derive a comparable metric of antimicrobial consumption across time.

Results: A decrease in overall utilisation of antibiotics was noted in the private sector, but with an increase in utilisation of all other antibacterials' (J1X9), comprising daptomycin, fusidic acid, linezolid and tigecycline for both sectors. Antiretroviral (ART) utilisation data indicated an increase in fixed dose combination (FDC) utilisation (both sectors) with a significant increase in protease inhibitor use (public sector). The utilisation of anti-tuberculosis (TB) medicines in the public sector was considerably higher than that of the private sector and may be because TB in SA is mainly treated in the public sector as part of the national Directly Observed Therapy, Short Course (DOTS) programme.

Conclusions: Despite its limitations, this analysis serves as an indicator of antimicrobial exposure at population level and as an alternate method for ascertaining antimicrobial consumption in human health.

Prophylactic antibiotic usage in the prevention of surgical site infections in Princess Marina Hospital, Botswana

SAIJINI SOUDA1, JULIUS MWITA1, MICHAEL MWANDRI1,
Email of submitting author: sajini.souda@gmail.com

1University of Botswana, Gaborone, Botswana

Background: Antibiotic prophylaxis in surgery is known to reduce the rate of surgical site infection (SSI), and shorten hospital stay. There is scarcity of data on the prescription pattern of antibiotic prophylaxis regimens and prevalence of SSI in Botswana.

Objectives: To describe antibiotic surgical prophylactic regimens and the burden of SSI at Princess Marina referral hospital (PMH), Botswana.

Methods: A prospective study involving 400 patients was carried out at PMH from Feb 2014- June 2015. Patients' demographic information, type of surgery performed and peri-operative use of antibiotics were documented. All enrolled patients were followed-up for one month to detect the development of SSI. Microscopy culture and sensitivity carried out in patients who develop SSI. Data analysis was done using Stata 13.

Results: The median age of the participants were 35.5 years (IQR 25-50) with 208 (52%) females. There were 140 (35%) emergency and 260 (65 %) elective surgeries. The most common operations were explorative laparotomy (25%), appendectomy (14%), mastectomy (8%), hernia repair (6.25%), hydrocoelectomy (5.25%) and cholecystectomy (4.5%). Cefotaxime (59%), cefradine (34%), metronidazole (32%) were given as perioperative prophylaxis in 59 (14.75%) patients. 42 patients who started on antibiotics perioperatively continued using them post operatively. A total of 273 (68.75%) patients were only given post-operative prophylaxis. Post-operative medications included cefotaxime (75.1%) and metronidazole (66.7 %). During postoperative follow up 31 patients reported discharge from operation site of which 17 (4.75%) yielded positive culture results. All 17 had history of antibiotic exposure before culture. Organisms isolated were Staphylococcus aureus- 4, Coagulase Negative staphylococcus- 3, Citrobacter spp. – 2, Pseudomonas – 4, E.coli -2, Enterobacter-1, Klebsiella – 1, Streptococcus -1. One of the S.aureus was methicillin resistant. All S.aureus isolated were sensitive to Clindamycin.

Conclusion: Cefotaxime and metronidazole are commonly prescribed for surgical prophylaxis. Low (4.75%) prevalence of SSI reported at PMH.

Patterns of antibacterial use at medical ward in Muhimbili National Hospital in Tanzania

RAPHAEL Z. SANGEDA, MARIKI I URASSA, DEUS BUMA

Introduction: In order to assess and compare the antibiotic utilization, a proper drug classification system is required to organize the data of antibacterial use in a uniform way. The Anatomical Therapeutic Chemical (ATC)/Defined Daily Dose (DDD) is one of the methods that is widely used as recommended by the WHO collaborative center for international drug monitoring.

Objectives: The aims of this study was to determine the defined daily dose (DDD) of each prescribed group of antibacterial and the proportions of wide-spectrum antibacterial used in Kibasila ward at Muhimbili National Hospital (MNH) in Tanzania.

Methods: A retrospective descriptive study covering 1st January 2015 to 31st December 2015 was conducted. Data of antibacterial prescribed and dispensed was obtained from the MNH database. The ATC/DDD system designed by the WHO collaborative center for international drug monitoring in Europe was used to determine the patterns of antibacterial use.

Results: The quantity of antibiotics consumed at the ward was unevenly distributed over the 12 months period. The months of April and September registered high levels of antibacterial use. Capsules were the most dispensed dosage form. There were a total of 19 different antibacterial which were used in the ward. These were prescribed and dispensed to 1496 unique patients. The drug ciprofloxacin was the leading with DDD of about 3760 per year. This was followed by amoxicillin and metronidazole. The proportion of wide spectrum antibiotics was as high as 79%.

Conclusions: The varying amounts of drugs and peaks observed in months of April and September may coincide with the months in which there was bulk supply from Medical Store Department. This indicates presence of periods when alternative supplies of antibiotics such as private pharmacies are needed to meet patient needs. Overall only 19 varieties of antibiotics are used in the ward compared to the drugs in the standard treatment guideline. The study findings indicate that more utilization studies are required for the antibacterial in order to continue surveillance of consumption against the threat of rising antibacterial resistance.

Assessment of the rational use and availability of antimicrobials at primary level health facilities under the Lusaka district community health office, Zambia

PHIRI EPHRAIM1, HAZEL BRADLEY2
Email of submitting author: phiri.ephraim89@gmail.com

1Evelyn Hone College of Applied Arts and Commerce, Zambia, School of Applied and Health Sciences, Pharmacy Section
2University of the Western Cape, South Africa.

Background:
The irrational use of medicines remains a key health problem in many developing countries including Zambia, in heath facilities at all levels.

Objectives:
1. To describe the prescribing practices of antimicrobials by healthcare providers at primary level health facilities under the Lusaka district community health office, Zambia.
2. To describe the dispensing practices of antimicrobials by healthcare providers at primary level health facilities under the Lusaka district community health office, Zambia.
3. To determine the availability of antimicrobials at the primary level health facilities under the Lusaka district community health office, Zambia.
4. To determine the availability and access to the essential medicines list at the primary level health facilities under the Lusaka district community health office, Zambia.

Methods:
The methods employed in the study were adapted from the World Health Organization (1993) publication: How to investigate drug use in health facilities. This cross-sectional descriptive, prospective and retrospective, study analyzed 800 patient encounters, 520 medicines inventory records, and other baseline data, 20 health facilities at three different levels under the Lusaka district community health office, Zambia.

Results:
A mean of 2.94 medicines were prescribed per prescription, with a low rate of prescribing drugs by generic name (36.7%). The proportion of prescriptions for antibiotics was 36.2%, for injectable drugs 3.4% and often unnecessary. The essential drugs list was available in 80.0% of facilities and a high percentage of medicines were prescribed from the essential medicines list (81.2%). The overall mean percentage of medicines packages correctly labeled was considerably low at 44.8 %; ranging from, 3 – 92 %. The average consultation time was significantly short at 4.0 minutes, ranging from 1- 8.4 minutes, whereas the dispensing times were equally short and averaged at 116.6 seconds, with the range of 15 to 360 seconds.

Conclusions:
The study results show that there is irrational use of antimicrobials in the primary health care clinics. Dispensers and prescribers are not spending sufficient time with the patients. Continuing education, monitoring and supervision of prescribers and dispensers is necessary.

Position statement – Over the counter use of antibiotics in Africa

NATALIE SCHELLACK1, JOHANNA C MEYER1, CHUKWUEMEKA UBAKA1, LUCILLE MALAN1, DEIRDRE ENGLER1, PHUMZILE SKOSANA1, MARGARET OLUKA2, SYLVIA OPANGA2,3, BRIAN GODMAN4,5, AUBREY CHICHONYI KALUNGIA6, SEKESAI MTAPURI-ZINYOWERA7, JOSEPH FADARE8, AND DAN KIBUULE9
Email of submitting author: natalie.schellack@smu.ac.za

1School of Pharmacy, Sefako Makgatho Health Sciences University, South Africa
2School of Pharmacy, University of Nairobi, Kenya
3Clinical Pharmacy Specialist, Kenyatta National Hospital, Nairobi, Kenya
4Division of Clinical Pharmacology, KI, Stockholm, Sweden
5 Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK
6Department of Pharmacy, University of Zambia, Lusaka, Zambia,
7Ministry of Health and Child Care, Zimbabwe
8Department of Pharmacology and Therapeutics, College of Medicine, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria
9School of Pharmacy, Faculty of Health Sciences, University of Namibia

Background: Provision of reliable antimicrobial consumption data is a prerequisite to understanding antimicrobial resistance (AMR), since selection pressure from largely indiscriminate antimicrobial use is one of the main drivers of resistance. The Global Action Plan (GAP) on AMR provides a 'One Health' blueprint for national action plan development across human, animal, and environmental health, and calls for optimizing the use of antimicrobial medicines in human and animal health in tandem with strengthening of the knowledge and evidence base through surveillance and research. Central to these concerns is the doctrine that overuse and misuse of antibiotics is a key factor in facilitating emergence of AMR and the corollary that self-prescribing of antibiotics for often viral infections plays a dominant role in the equation in the developing world.

Purpose: To draft a position statement to reduce misuse, including irrational use, of antibiotics (prescribing, dispensing, use) amongst all key stakeholders across Africa, given the high prevalence of infectious diseases across the continent.

Approach: To draft a position statement, providing a guiding document that could reduce misuse, including irrational use, of antibiotics amongst all stakeholders across Africa, especially patients, pharmacists and physicians. This could include improving prescriber knowledge, patient education and awareness, as well as legislation on antibiotic OTC availability.

Outcome: The position statement could influence practice and policy that can result in improved prudent use of antimicrobials across Africa – focusing especially on reducing antibiotic OTC availability where pertinent. A position statement from key stakeholders in Africa on OTC use of antibiotics might make a strong stance in reducing irrational antibiotic use in the future.

An innovative web-based Pharmaceutical Information Dashboard enhances evidence-based decision making in ART pharmaceutical services in Namibia

WULETAW CHURFO1, K KAMBYAMBYA1, B PHULU2, H KAGOYA2, E SAGWA2, W ZELEKE1, R INDONGO3
Email of submitting author: wulexzel@gmail.com

[1]Ministry of Health and Social Services (MoHSS): Namibia,
[2]USAID-funded Systems for Improved Access to Pharmaceuticals and Services (SIAPS)/Namibia, Windhoek;
[3]USAID Namibia, Windhoek

Background: The USAID's SIAPS program has supported MoHSS to implement patient and inventory management tools and information systems to facilitate decision-making in pharmaceutical service delivery. Reporting systems for aggregating data and giving feedback to managers have been largely manual, leading to inaccurate patient and commodity data, and failure by managers to respond timely to threats to service delivery.

Objective: To improve availability and visibility of antiretroviral therapy (ART) patients and pharmaceutical data for decision-making

Methods: SIAPS supported the MoHSS to design and implement a web-based electronic information system (dashboard) for both patient and stock status in Namibia. It was designed to improve coordination among facility, regional and national stakeholders involved in HIV commodity management, increase the use of pharmaceutical management information for decision making at all levels of healthcare and improve planning for financial resources for pharmaceutical commodities. The dashboard comprises a module for monitoring 22 indicators of pharmaceutical services delivery, a module for the number of people accessing ART, an early warning system against stock outs of ARV and other essential medicines.

Results: The dashboard launched by the Minister of Health in Windhoek in June 2016 has been successfully implemented in 35 hospitals and 4 health centers countrywide. Regional pharmacists have access to reports on patient data and the stock status of pharmaceuticals enabling them to make vital decisions to avert stock outs. To-date 97 of 108 (90%) registered MoHSS managers are using the dashboard for decision making in pharmaceutical services.

Conclusions: Web-based dashboard systems increase availability and visibility of data from facility-based electronic tools and information systems. The data is critical for making informed decisions and timely action for optimal management of patients on ART and inventory of pharmaceutical commodities.

Paediatric Antiretroviral Treatment Uptake, Treatment Adherence, Regimen Switches, and Retention in Care in Namibia

GREATJOY MAZIBUKO1, NICHOLUS MUTENDA2, NDAPEWA HAMUNIME2, FRANCINA KAINDJEE-TJITUKA2, TADESSE MEKONEN2, ASSEGID MENGISTU2, EVANS SAGWA1, ROSALIA INDONGO4, HARRIET KAGOYA1, SAMSON MWINGA1, INNOCENT MAPOSA5, DAVID MABIRIZI3, MAHEEN MALIK1, DINAH TJIPURA3,
Email of submitting author: gmazibuko@msh.org

1Management Sciences for Health (MSH) / Systems for Improved Access to Pharmaceuticals and Services (SIAPS) project
2Ministry of Health and Social Services (MoHSS)
3MSH/SIAPS
4USAID Namibia
5Namibia University of Science and Technology

Background: AIDS is among the top 10 medical causes of death in Namibia. In August 2016, 9, 462 children in Namibia living with HIV were receiving antiretroviral therapy (ART) in the public sector.

Objectives: To determine the ART uptake, patient adherence to ART, retention and regimen switches among paediatrics.

Methods: A longitudinal analysis of routinely collected paediatric data from 2010 to 2015 in the electronic dispensing tool (EDT) database in Namibia was conducted. Data on paediatric ART patients from the 50 main public health ART sites in Namibia was extracted into excel, anonymized, cleaned and analyzed using Stata v11 and Microsoft-excel to generate percentages, perform survival analyses, and determine associations between variables.

Results: A total of 5,476 children aged 0-14 years were enrolled for ART from 2010 to 2015. The number of children starting ART decreased over the years. Thirty percent (30%) of these newly enrolled children in 2010-2015 were 1-4 years old. Eight percent (8%) of the 5,476 children switched from first to second line ART regimens. 61% of the switches were observed among males (log-rank test: *p*=0.000) and the 10-14 age group. The main reason for switching was virological failure. The rate of switching from first to second line ART regimens increased after 12 months of treatment. Younger children 0-4 years (59%) tended to be more LTFU than older children.

Conclusions: Paediatric ART enrolment has been reducing over the years. Most switches from first to second line ART regimens were observed among the males and the 10-14 year age group. Clinical factors could attribute to early switching. Routine analysis and use of EDT data for program operational research is important in identifying ART trends and signals for decision making. Efforts should be put in place to ensure increased paediatric uptake and adherence to first-line regimens.

Dispensing patterns of anti-migraine agents with the focus on seasonal variations in prescribing

ILSE TRUTER, BERNADETTE LOUWRENS
Email of submitting author: ilse.truter@nmmu.ac.za

Drug Utilization Research Unit (DURU), Nelson Mandela Metropolitan University, South Africa

Background: Migraine trigger factors are precipitating factors that can contribute to an attack by increasing the probability of a migraine occurring. Weather is one such environmental trigger factor. Studies of weather sensitivity in migraineurs has reported some seasonal variation in migraine attacks with a slight dependency of migraine attacks on months.

Objectives: The aim was to determine the dispensing patterns of anti-migraine agents in a private healthcare setting in South Africa, with the focus on seasonal variations in the prescribing of these agents.

Methods: A retrospective, cross-sectional drug utilisation study was conducted on a South African medical insurance administrator database for 2016. The database contained 3 567 170 records for medicine, medical devices and procedures. All products in MIMS category 1.9 (Anti-migraine agents) were analysed.

Results: A total of 914 anti-migraine products were dispensed to 505 patients (69.70% females) at a cost of R167 302.00. The average age of patients was 41.57 (SD=13.77) years, with 62.38% of patients between 35 and 64 years of age. The majority (78.01%) of products were dispensed by pharmacies. Of the eight active ingredients, clonidine was the most often dispensed (34.68%), followed by rizatriptan (28.01%) and ergotamine (26.04%). Proportionally, more clonidine prescriptions were dispensed to females than to males (39.31% versus 19.82%). Prescribing peaks were observed for all active ingredients in February to April, and again in October. These months coincide with the change in seasons to winter and to summer in South Africa. There was a general decrease in the dispensing of anti-migraine agents towards the end of the year.

Conclusions: The sample size was too small to make definite conclusions, but it seems as if the prescribing of anti-migraine agents showed peaks during the times of year when the seasons change (autumn and spring) confirming that weather is a possible trigger factor in migraine.

Incidence and Determinants of Medication Errors among Paediatric In-Patients at a Rural Referral Hospital in Kenya.

CHRISTABEL N. KHAEMBA[1,2], ERIC M. GUANTAI[1], MARGARET N. OLUKA[1], KIPRUTO A. SINEI[1], AMANJ BAKER[3], BRIAN GODMAN[3,4]

Email of submitting author: cnkhaemba@gmail.com

[1]*Department of Pharmacology & Pharmacognosy, School of Pharmacy, University of Nairobi, Kenya.*
[2] *Ministry of Health, Kenya*
[3]*Strathclyde Institute of Pharmacy and Biomedical Sciences, Strathclyde University, Glasgow, UK.*
[4]*Department of Laboratory Medicine, Division of Clinical Pharmacology, Karolinska Institutet, Stockholm, Sweden.*

Background: Medication errors in paediatric patients carry a much higher risk. Studies report that medication errors are up to three times more common in children compared to adults due to rapidly changing body surface area, height and weight.

Objective: To determine the prevalence, types and predictors of medication errors in paediatric in-patient wards at a county referral hospital in Kenya.

Methods: A descriptive cohort study of children aged 0-5 years, admitted to the general paediatric ward and newborn unit. Review of files upon admission and prospectively for a period of up to one month. Data on prescription and medication use analyzed for prevalence, types, and predictors of medication errors.

Results: A total of 405 files, with 307 containing at least one medication error, yielding an overall medication error rate of 75.8%. The total number of medication errors was 1023, consisting of documentation errors (73.9%), dosing errors (8.8%), monitoring errors (8.6%) and timing errors (5.7%). Medication errors were more frequent in male children, children less than one year (45.9%) and those admitted to the general paediatric ward (48.4%). Logistic regression of dosing errors revealed that children receiving more than five medicines had over six times the odds of experiencing dosing errors (OR 6.4; 95% CI: 2.7-15.1; P<0.001). Route of drug administration was also a significant predictor of dosing errors (P <0.001).

Conclusions: Incidence of medication errors was high among paediatric in-patients in Kenya, with documentation and dosing errors most common. The number of drugs and route of administration were important predictors of dosing errors. Medication errors can be a major risk factor in sick children under 5 years who are already subject to significant morbidity and mortality. Some of these errors can be potentially fatal. Consequently, a need for hospitals to have strategies for detection and prevention of medication errors in paediatric populations focusing on healthcare providers.

Predictors of adherence to oral antihypertensives among patients attending two district hospitals in northern Volta, Ghana

EMMANUEL SARKODIE1, AND DANIEL AFRIYIE2
Email of submitting author: esarkodie@uhas.edu.gh

1*School of Pharmacy, University of Health and Allied Sciences, Ho-Ghana*
2*Director of Pharmacy, Ghana Police Hospital -Accra*

Background:
Hypertension is a common public health problem globally, with about 7.5 million deaths annually. Blood pressure control is generally poor among hypertensive patients in sub-Saharan Africa. Poor adherence to antihypertensive therapy is a set back to the management of hypertension. It causes both medical and psychological complications of the disease, reduces patients' quality of life, wastes scarce health care resources and finally erodes public confidence in the healthcare systems

Objectives:
The study aimed at determining the factors influencing adherence to oral antihypertensives among patients attending two district hospitals in northern Volta, Ghana

Methods:
A cross-sectional study was conducted on hypertensive patients (18years and above) attending the outpatient department of two district hospitals in the northern Volta region; Krachi west district (n=187) and Hohoe municipal (n=183). Data collection was done between March-May 2016 using a structured questionnaire and Morisky 8 Item Measurement of Adherence Scale. Data was analyzed using Statistical Package for Social Sciences (version 16) and p value of ≤ 0.05 was regarded statistically significant.

Results:
Of the 370 respondents who participated in this study, prevalence of adherence to antihypertensive medications was 89.2%, with more than half (53.3%) of respondents having uncontrolled blood pressure. The strongest predictors of adherence using the multiple regression analysis were; knowledge level of respondents on hypertension (B=0.135), respondents perception of severity of their condition (B=-0.124) and lastly the amount of alcohol consumed in a day by respondents (B=0.074).

Conclusions:
Though high prevalence of adherence to antihypertensive medications was observed in this study, regular patient education and adherence counselling by pharmacists should be encouraged to improve patient's adherence levels to their antihypertensive medications.

Adherence to chronic antihypertensive medication by patients managed at primary health care facilities in a rural district of Limpopo Province, South Africa

ENOS M RAMPAMBA1, JOHANNA C MEYER1, BRIAN GODMAN2,3,4, AMANJ BAKER2, ELVERA HELBERG1
Email of submitting author: mrampamba@gmail.com

1School of Pharmacy, Sefako Makgatho Health Sciences University, South Africa
2Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, United Kingdom;
3Department of Laboratory Medicine, Division of Clinical Pharmacology, KI, Stockholm, Sweden;
4Health Economics, Liverpool University Management School, Liverpool, UK

Background*:*   One of the cornerstones of blood pressure (BP) control in hypertensive patients is adherence to both pharmacological and non-pharmacological management. This is important in South Africa (SA) with its high prevalence rates for cardiovascular disease and current initiatives to improve care and access to medicines for chronic disease patients.

Objective: To determine the level of adherence to antihypertensive treatment and possible associations between adherence and factors affecting adherence in ambulatory care.

Methods: Descriptive, quantitative study design at primary health care (PHC) clinics in the Vhembe District, Limpopo Province, SA. Trained pharmacists interviewed 251 conveniently selected chronic hypertensive patients collecting medication. Adherence was assessed using a self-reported rating scale with six pre-defined categorised responses. Patients were categorised as adherent (excellent) or sub-optimally adherent (very good, good, fair, poor, very poor) according to ratings. Associations between adherence and patient characteristics were determined using the Chi-square test.

Results: All patients were treated with one/more antihypertensive drugs, listed in the SA PHC Essential Medicines List, of whom 54.6% were categorised as adherent. Less than half had controlled BP, of whom 59.8% were adherent. Two thirds (62.2%) of educated patients (n=111) were adherent, compared to 48.9% of patients without education (n=139) (p=0.036). Only 31.0% of 29 smokers were adherent, compared to 57.7% of 222 non-smokers (p=0.006). With borderline significance (p=0.054), 61.9% of 118 patients with co-morbidities reported adherence compared to 49.6% of 127 patients without any co-morbidity

Conclusions: Both adherence and BP control were sub-optimal in this study population. Only half of the patients rated themselves as adherent to antihypertensive medication and only half of the patients' BP was controlled. Improving adherence in this hypertensive patient population can improve BP control, with further research needed to identify factors contributing to non-adherence and to inform relevant strategies to improve adherence and care

Knowledge of hypertension and its management among hypertensive patients on chronic medicines at primary health care public sector facilities in South Africa; findings and implications

ENOS M RAMPAMBA1, JOHANNA C MEYER1, ELVERA HELBERG1, AMANJ BAKER2, BRIAN GODMAN2,3,4
Email of submitting author: mrampamba@gmail.com

1school of Pharmacy, Sefako Makgatho Health Sciences University, South Africa
2Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, United Kingdom
2Department of Laboratory Medicine, Division of Clinical Pharmacology, Karolinska Institutet, Stockholm, Sweden
3Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, UK
4Health Economics, Liverpool University Management School, Liverpool, UK

Background: Prevalence rates of hypertension in South Africa (SA) are high, with hypertension ranked seventh amongst the major underlying causes of death. The government recently introduced the Central Chronic Medicines Dispensing and Distribution programme to improve care and access to medicines for patients with chronic diseases.

Objective: To assess the knowledge of hypertension and its management among hypertensive patients receiving chronic medication from primary health care (PHC) facilities in SA as a basis for improving future management.

Methods: A descriptive, quantitative study was conducted amongst 253 conveniently selected chronic hypertensive patients collecting their medication from PHC facilities in the Vhembe District, Limpopo Province of SA. Patients were interviewed face-to-face by pharmacists using a structured questionnaire. Ethical clearance was granted and participants provided written informed consent.

Results: Half (53.7%) of the patients had uncontrolled blood pressure (BP) and 62.3% were on antihypertensive treatment >5 years. Less than half (46.9%) of patients knew what causes high BP, and less than a third knew what hypertension is (27.7%), the meaning of recorded BP numbers (4.5%), and what normal BP should be (19.9%). The difference between patients with- and those without education, regarding knowledge concerning the causes of BP, the meaning of BP numbers what normal BP should be, was significant (p<0.001). Less than half (46.9%) of the patients indicated that they can do something to lower their BP. Half of the patients (56.0%) indicated to have received hypertension information from the clinics of whom only 15.6% claimed to have received information about antihypertensive medicines.

Conclusions: The majority of patients lacked hypertension specific knowledge and only half had controlled BP. Interventions to improve the control of high BP should be targeted at closing knowledge gaps as part of the current chronic treatment initiatives to ensure the benefits of increased access to care are realised.

Assessing adherence to antihypertensive therapy in primary health care in Namibia: findings and implications

MAGDALENE MARIA NASHILONGO1, B SINGU1, F KALEMEERA1, M MUBITA1, E NAIKAKU1, B GODMAN2,3, A BAKER KURDI3, D KIBUULE1
Email of submitting author: magdaleenanash@gmail.com

1School of Pharmacy, Faculty of Health Sciences, University of Namibia, Namibia
2Division of Clinical Pharmacology, KI, Stockholm, Sweden
3Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow UK

Background: Namibia has the highest mortality and incidence of hypertension in sub-Sahara Africa. Non-adherence to antihypertensive therapy is an important risk factor for poor health outcomes. However, there is limited evidence on determinants to improve adherence to antihypertensive therapy among patients in Namibia. This is particularly important following the implementation of universal access in Namibia including hypertensive medicines.

Objectives: Determine the level of adherence to antihypertensive treatment and factors associated with improving adherence to antihypertensive medicines among primary health care (PHC) settings in four suburban townships of Windhoek, Namibia

Methods: Cross-sectional study using WHO/INRUD methods for medicine use surveys with adherence assessed using the Hill-Bone compliance to high blood pressure therapy scale.

Results: None of the 120 patients surveyed had perfect adherence to antihypertensive therapy, and less than half had acceptable levels of adherence (defined as ≥80%). The mean adherence level was 77.9± 7.39 %. Three quarters of patients had ever missed their scheduled clinic appointment. Most patients (83.3%) reported receiving adequate information on medicine use. Patient's age (OR = 3.287, 95% CI: 1.39 – 7.772, p = 0.005); the location of the primary health care facility (p = 0.039); having a family support system (OR = 5.271, 95% CI: 1.687 – 16.473, p = 0.02) and attendance of follow-up visits (OR = 5.063, 95%CI: 2.287 – 11.206, p < 0.001) were significantly correlated with greater adherence to antihypertensive medicines. Having HIV/ AIDs did not lower adherence rates despite increasing the pill burden.

Conclusions: There is sub-optimal adherence to antihypertensive therapy among patients attending PHCs in Namibia. This needs standardized systems to strengthen adherence monitoring as well as investigation of other factors adversely affecting adherence, including transport, to take full advantage of universal access. This is being followed up.

Quality of Anticoagulation with Warfarin at a tertiary hospital in Botswana

JULIUS MWITA, MAREA GAENAMONG, MONKGOGI GOEPAMANG
Email of submitting author: mwitajc@ub.ac.bw

Department of internal medicine, Princess Marina Hospital, Botswana

Background: Warfarin is used for both treatment and prophylaxis for thromboembolism in variety of conditions. It often requires a regular and good monitoring to avoid over-anticoagulation and at the same time prevent thromboembolic complications.

Objectives: This study aimed at describing the indications of anticoagulation and also at assessing the adequacy of warfarin anticoagulation in patients at Princess Marina Hospital.

Methods: It was a cross-sectional study that consecutively enrolled patients who were on warfarin attending the Princess Marina Hospital outpatient medical clinics. Both male and female patients on warfarin treatment for at least 3 months were included. The level of anticoagulation was determined by the time- in- therapeutic range (TTR) using the Rosendaal method that calculates the percent of days when the INR is in the therapeutic range (2.0 to 3.0). Poor anticoagulation control was defined as an estimated TTR < 65%.

Results*: A total of 410 patients (68.8% women) were enrolled. The median age was 46 (35-58 years). A total of 2013 tests assessed, with an average of 4.9 tests per patient. Mean TTR was 34.79% ± 24.79%, and on average only 26.18% of the tests were within the therapeutic range. The prevalence of poor anticoagulation control was 85.1%. Indications for warfarin were prosthetic mechanical heart valves (45.1%), Deep vein thrombosis (26.8%), atrial fibrillation (17.8%), pulmonary embolism (2.4%), intra-cardiac thrombi (4.9%) and pulmonary hypertension (1.7%). The level of anticoagulation control was not associated with gender, age or indication for warfarin.

Conclusions: The quality of anticoagulant therapy with warfarin in Botswana patients is poor. Patients who receive warfarin for different indications spend only about 15% of the time within therapeutic range. Research on factors associated with poor anticoagulation control is recommended in Botswana

Access to medicines for children in Nigeria: An exploratory study of the quality of oral essential cardiovascular medicines and diuretics

SAMUEL ORUBU[1], EMMANUEL AMABEBE[2], FAITH O. ROBERT[1] & CATHERINE TULEU[3]
Email of submitting author: samuelorubu@lycos.com

[1]Niger Delta University, Bayelsa State, Nigeria
[2]University of Sheffield, UK
[3]University College London, UK

Background: Quality is at the core of access to medicines: a poor quality medicine offers no clinical benefit, and may actually cause harm (Keene, 2011; Wirtz et al., 2016). A study reported in the recent Lancet Commission Report on Access to Medicines placed the proportion of substandard antimalarial in Nigeria as high as 64% (Wirtz, et al., 2017). There is not much information on the quality of medicines for non-communicable diseases, and none on the quality of cardiovascular medicines for children. Access to quality medicines for children is necessary for achieving SDG-3 targets of Universal Health Coverage.

Objectives: The aim of the present study is to conduct an exploratory study of the quality of essential cardiovascular medicines and diuretics for children; necessary to track progress towards SDG-3.

Methods: Cardiovascular medicines and diuretics assessed were enalapril, furosemide, hydrochlorothiazide, and spironolactone, as listed in the Essential Medicines List for children (2015). The mystery-shopper approach was used to obtain the samples from private pharmacies. Facilities surveyed were purposively and conveniently selected to include those in proximity to hospitals with paediatric departments in three selected capital cities in Nigeria. The quality of the collected samples was assessed using registration by the local regulatory agency, NAFDAC, and assay by UV-Vis spectroscopy. Assay results were compared with the British Pharmacopeia (BP) quality specification.

Results: A total of 43 samples were collected from 11 pharmacies. While 63% of these samples were not registered by NAFDAC, 30 of these samples, randomly assayed for active ingredient content, all met the BP specifications.

Conclusions: The results suggest that the sampled cardiovascular medicines and diuretics were of quality, regardless of registration by the LRA. More studies are warranted to provide a comprehensive account of the quality of cardiovascular medicines and diuretics for children in Nigeria.

POSTER PRESENTATIONS

Evaluating initial antimicrobial use in an adult medical intensive care unit at an academic teaching hospital in Pretoria, South Africa

NATALIE SCHELLACK1, TARINA BESTER1, ANDRIES GS GOUS1, ANTON STOLTZ2, JOHANNA C MEYER1, BRIAN GODMAN3,4,5,
Email of submitting author: natalie.schellack@smu.ac.za

1School of Pharmacy, Sefako Makgatho Health Sciences University, South Africa
2Infectious Diseases, University of Pretoria, South Africa
3Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, United Kingdom;
4Department of Laboratory Medicine, Division of Clinical Pharmacology, KI, Stockholm, Sweden
5Health Economics Centre, Liverpool University, Liverpool, UK

Background: Antimicrobial resistance is increasing globally enhanced by irrational use of antibiotics. It is estimated that in hospitals 50% of antimicrobial usage is either unnecessary or inappropriate. However, there is limited knowledge regarding antibiotic use in many countries including South Africa. This includes Intensive Care Units. A clinically trained pharmacist was included as part of the multi-disciplinary team and evaluated patients' prescription charts daily against established criteria including indication, dose and blood cultures.

Objectives: This study aimed to explore factors surrounding initially prescribed antibiotics and direct medicine-related costs in the adult medical intensive care unit (MICU) at Steve Biko Academic Hospital (SBAH).

Methods: Operational study with a descriptive and observational design, conducted through daily ward rounds over a seven month period. Antibiotics that were prescribed after a patient was admitted to the MICU were included in the study and considered as the "initial course of antibiotics". Antimicrobial agents that the patient was admitted on were documented and are referred to as *"antibiotics prior to review"*.

Results: Less than half of the patients, 23 (44.2%; n = 52) were initiated on antibiotics on the first day of admission to the MICU. More than half (60.5%) of the antibiotics were prescribed appropriately during the study period. The total cost of initial antibiotic use for the treatment period during the study was R209 140.40, with an average cost of R31 240.77 per day for all initial antibiotics.

Conclusions: A coordinated effort from the infectious diseases specialist, and the clinical pharmacist within the multi-disciplinary team, assisted in the appropriate prescribing of antibiotics to patients admitted to the MICU. However, room for improvement. The presence of a clinical pharmacist and infectious diseases specialist, with the addition of an antibiotic policy and training, may further enhance rational antibiotic use in the future. This will be explored further.

Compliance to the Primary Health Care Treatment Guidelines and the Essential Medicines List in the Management of Sexually Transmitted Infections in Two Correctional Centres in South Africa: Findings and Implications

TAMMY B MATSITSE1, ELVERA HELBERG1, JOHANNA C MEYER1, BRIAN GODMAN2,3 AMOS MASSELE4 AND NATALIE SCHELLACK1
Email of submitting author: tammy.matsitse@gmail.com

1School of Pharmacy, Sefako Makgatho Health Sciences University, South Africa; 2Department of Correctional Services, Pretoria, South Africa.
2Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, UK and
3Department of Laboratory Medicine, Division of Clinical Pharmacology, KI, Stockholm, Sweden
4Department of Clinical Pharmacology, School of Medicine, University of Botswana, Gaborone, Botswana

Background: The emergence of antimicrobial resistance (AMR) is a global concern and a growing health crisis. Evidence has shown that non-compliance to standard treatment guidelines (STGs), especially in the management of communicable diseases such as sexually transmitted infections (STIs), has the potential of increasing AMR rates. Data on the extent of these challenges in Primary Health Care (PHC) facilities in correctional centres in South Africa (SA) is limited

Objectives: To determine the level of compliance with the 2008 PHC STGs and Essential Medicines List (PHC STGs/EML) in the management of STIs in two correctional facilities, and to identify potential factors contributing to the compliance and non-compliance to guide future strategies.

Methods: An investigational and descriptive study was conducted. Prescriptions for the treatment of STIs were reviewed retrospectively to determine the level of compliance with the PHC STGs/EML. Interviews were conducted with 8 of 12 authorised prescribers at the facilities to identify factors that lead to non-compliance with guidelines.

Results: From 262 prescriptions reviewed, male urethritis syndrome (MUS) (47.6%), lower abdominal pain (LAP) (22.1%) and genital ulcer syndrome (GUS) (18.8%) were the most common STIs treated. Doxycycline, ciprofloxacin and metronidazole were prescribed for most of the STIs. Although prescribers indicated that they used the PHC STGs/EML when managing STIs, compliance was 75.9% for MUS, 14.8% for GUS and 11.4% for LAP. In 80.5% of the medicines prescribed, the dosage was compliant with the PHC STGs/EML A barrier that negatively impacted on compliance with guidelines was non-availability of certain STI medicines.

Conclusions: Compliance with the PHC STGs/EML for treatment of STIs was variable, which could contribute towards increasing AMR rates. Recommended interventions include targeted training, antimicrobial stewardship programmes and monitoring of prescribing by PTCs to promote the rational use of antimicrobials in PHCs in SA. This will be followed up.

Antibiotic sensitivity patterns of common bacterial pathogens associated with hospital-acquired pneumonia in Katutura Intermediate Hospital – implications for empirical treatment

SHARON HUBER, FRANCIS KALEMEERA, ESTER NAIKAKU, DAN KIBUULE, AND MWANGANA, MUBITA
Email of submitting author: sharonkang89@gmail.com

1Faculty of Health Sciences, School of Pharmacy, University of Namibia, Windhoek, Namibia

Background: Hospital-acquired pneumonia (HAP) is a nosocomial infection with the highest mortality rate. The Namibia Standard Treatment Guidelines (NSTGs) recommends the initiation of empirical antibiotic therapy with a combination of ampicillin and gentamicin or cefuroxime monotherapy against the most common pathogens. A review of the local antibiograms is necessary to ensure adequate antibiotic coverage is achieved by currently recommended antibiotics. Inadequate antibiotic coverage may not only lead to poor clinical outcomes, but may also contribute to the emergence and spread of antibiotic resistance. Currently, there is a global threat to healthcare due to the emergence of bacterial strains showing resistance to commonly used antibiotics given the fewer antibiotics in the research and development pipeline.

Objectives: To describe the antimicrobial sensitivity patterns of bacteria isolated from sputum to recommended antibiotics and identify its implications on the empirical treatment of HAP at Katutura Intermediate Hospital (KIH) in Namibia

Methods: A cross-sectional, descriptive study was carried out based on routinely collected antibiotic susceptibility data from the Namibia Institute of Pathology (NIP) database. Results of sputum culture and sensitivity tests from KIH from 01 January 2015 to 31 December 2015 were analyzed.

Results: There were 902 isolates of pathogens commonly implicated in HAP. Of these, the most common pathogens isolated were *Klebsiella pneumoniae (n=335, 37.14%)*, *Staphylococcus aureus (n=234, 25.9%)*, *Pseudomonas aeruginosa (n=106, 11.8%)*, *Escherichia coli (n=87, 9.6%)*, *Enterobacter cloacae (n=55, 6.10%)*, and *Acinetobacter baumannii (n=9, 1.00%)*. Resistance to ampicillin ranged from 33.3% to 100% in the gram-negative bacilli, and the resistance to gentamicin was high in the ESBL *E. coli* (42.9%) and the ESBL *K. pneumoniae* (93.5%). Resistance to cefuroxime was high in *Acinetobacter* (50%), ESBL *K. pneumoniae* (97.8%), ESBL *E. coli* (100%), and *P. aeruginosa* (100%). In general, the gram-negative bacilli had greater sensitivity to cefepime and ceftazidime compared to cefuroxime. ESBL *K. pneumoniae* showed resistance to third-generation cephalosporins, 68.9% for ceftazidime and 97.8% for cefotaxime. The gram-negative coverage for *Enterobacteriaceae* species was the greatest with amikacin, carbapenems, colistin, and tigecycline. The MRSA isolates in this study were sensitive to vancomycin and linezolid. *P. aeruginosa* showed greater resistance to antipseudomonal beta-lactams, i.e. tazobactam-piperacillin (13.7%) and ceftazidime (10.5%), compared to gentamicin (1%) and colistin (0%). *Acinetobacter* species were sensitive to gentamicin and imipenem.

Conclusions: Based on these findings, we propose that current recommendations for empiric antimicrobial therapy of HAP at KIH should be updated. We suggest a combination of an extended-spectrum cephalosporin (e.g. cefepime) and aminoglycoside (amikacin or gentamicin) as the preferred empiric antimicrobial therapy of HAP. However, this combination should be validated by undertaking *in vitro* and *in vivo* antimicrobial susceptibility studies. Ciprofloxacin should be considered as an alternative antibiotic. If ESBL *K. pneumoniae* is suspected, cefoxitin should be considered in place of cefepime. Carbapenems, such as imipenem or meropenem, should be reserved for patients with high risk of mortality with suspected MDR HAP, while vancomycin should be added in cases where MRSA is suspected. Empiric therapy should be changed according to microbiological results.

The inappropriate prescribing of antibacterial medicines in Sudan: a national study at National Health Insurance setting in 2012

ISAM ELDIN MUSTAFA
Email of submitting author: pharmkal@hotmail.com

National Health Insurance Fund, SUDAN

Background: The irrational use of medicines is a common problem worldwide. Recent literature revealed that more than 50% of all medicines are prescribed inappropriately which results in serious public health problems like antimicrobial resistance. However, the extent of irrational antibacterials at National Health Insurance Fund (NHIF), Sudan is not well identified.

Objectives: To determine the pattern of antibacterial medicines prescribing at primary healthcare facilities of NHIF, Sudan

Methods: The study followed the method developed by the WHO/INRUD. Design: retrospective study. Setting and study population: Twenty primary health centres were selected from 5 states that represented the five geographical regions of the Sudan, then 2401 patients encounters were withdrawn from these centres by systematic random sampling from the year 2012. Outcome measure(s): Medicines Prescribing Indicators.

Results: On average the percentage of encounters with antibacterial is 64% (ranged from 43% in patients aged over 55 years, to 84% in children under five years old). The patient's age was negatively correlated with the percentage of encounters with an antibacterial prescribed ((r = -0.288, N = 2270, p < 0.01, two tails), while there were no significant differences in prescribing behavior of doctors for males or females (t = 0.919, p = 0.35, two tails). The main causes of antibacterials prescribing were upper respiratory tract infections, urinary tract infections, typhoid fever and gastro-intestinal disorders. Interestingly, 45% of patients with malaria received antibacterials.

Conclusions: There is over use of antibacterials which reflects the urgent need for development and implementation of antibiotics policy and Standard Treatment guidelines especially for management of respiratory infections, urinary tract infections and typhoid fever.

Renal function outcomes in patients receiving TDF-containing antiretroviral therapy: A retrospective pilot study in Namibia

FRANCIS KALEMEERA1, CARLA OBERHOLSTER1; INNOCENT SEGAMWENGE2, DAN KIBUULE1; ESTER NAIKAKU1; MWANGANA MUBITA1 AND BRIAN GODMAN3,4,5
Email of submitting author: fkalemeera@unam.na

1School of Pharmacy, Faculty of Health Sciences, University of Namibia, Windhoek, Namibia
2Department of Internal Medicine, Oshakati Intermediate Hospital; Oshakati, Oshana, Namibia;,
3Division of Clinical Pharmacology, Karolinska Institutet, Stockholm, Sweden;
4Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK
5Health Economics Centre, Liverpool University, UK

Background: Combination antiretroviral therapy (cART) has improved and prolonged lives of the HIV infected patients. cART has reduced the incidence of HIV related diseases such as HIVAN and non-HIVAN renal diseases. However, cART has been associated with renal impairment. Lack of pre-cART data in our recent study limited our ability to expound on renal-based treatment outcomes. The patients on this current study had renal function tests performed at three time points including before initiation of cART, during first-line and second-line cART.

Objectives: Assess CrCl over time per-patient, and provide plausible explanations for the observations seen. In addition, discuss the implications for the future management of HIV patients in Namibia and wider. This is particularly important in Namibia with its high prevalence of HIV as well as high prevalence of HIV among women similar to other Africa countries, but not to Western countries.

Methods: This was a longitudinal retrospective study, in which the patients' renal function was assessed using the Cockcroft-Gault method. Chi-square and McNemar Tests were used to assess the renal function, with the confidence level set at 95% and the p-value set <0.05 for significance.

Results: 71/81 patient records were included in the study. The majority were adults [76.1% (n=54)] and female, [59.2% (n=42)]. Before ignition of cART 70.4% (n=50) and 29.6% (n=21) had abnormal and normal CrCl, respectively. CrCl normalised in 12/50 (24%), while it became abnormal in 16/21 (76.1%). The mean (median) time to normalisation was 47.4(33.7) months. Normalisation was observed more in paediatric than in adult patients: 7/41 (17.1%) and 5/9 (55.6%); p-value=0.014. However, in paediatric patients, normalisation took longer than in adult patients: 62.2 (26.2 – 98.5) and 39.8 (24.0 – 55.6), respectively. The reduction in CrCl, in 16/21 patients, was observed at variable time points. 9/16 experienced the decline during first-line cART and 7 of these were receiving TDF. 7/16 experienced the decline during second-line cART and 6 were receiving TDF.

Conclusions: For many patients HIV was the cause of renal impairment prior to cART. TDF was suspected to be the cause of renal impairment during cART. Improvement in renal impairment was faster in adults than paediatric patients even though improvement was observed in more paediatric than adult patients.

Prescribing patterns at MEDUNSA Oral Health Centre, Pretoria: Findings and implications

MNCENGELI SIBANDA, K NKONDE, TP MASHABA, JC MEYER, EA HELBERG,
Email of submitting author: mncengelis@gmail.com

Sefako Makgatho Health Sciences University, School of Pharmacy, South Africa

Background: The irrational use of medicines remains a key health problem worldwide with negative consequences such as antimicrobial resistance, ineffective treatment, adverse effects, and increased costs. There are limited treatment guidelines for dental practice in South Africa. Interventions to improve quality have been shown to promote rational prescribing, however, baseline data on prescribing patterns is required.

Objectives: To determine prescribing patterns at Medunsa Oral Health Centre, so as to guide future quality improvement initiatives.

Methods: A quantitative retrospective review of 268 randomly selected prescriptions issued at the Medunsa Oral Health Centre between 1 October 2016 and 31 December 2016, was conducted. Prescribing indicators were identified aimed at obtaining a measurable result. Demographic information, diagnosis, utilization of different drug classes as well as individual drugs were recorded on a data collection sheet and analysed descriptively.

Results: The average number of drugs per prescription was 2.91 (n=268).72% of prescriptions contained antimicrobials, and in 21.6% of prescriptions more than one antimicrobial was prescribed. The most commonly prescribed antimicrobials were amoxicillin (65.3%) and metronidazole (23.1%). The majority (89.2%) of prescriptions contained analgesics, with two analgesics prescribed in 57.5% of prescriptions. Analgesics mostly prescribed included paracetamol (78.0%), ibuprofen (59.0%) and tramadol (18.7%). Treatment duplication was identified in 16.4% of prescriptions. Duration of treatment was given in 30.5% of the prescriptions and 64.8% of items were prescribed by generic name.

Conclusions: Results showed that there is considerable scope for improving prescribing patterns amongst prescribers at the Oral Health Centre. A quality improvement project is recommended subsequent to a route cause analysis and stakeholder engagement. This would include formulation of an antibiotic policy, establishment of treatment guidelines as well as targeted training for dentists and dental students on rational prescribing, prescription monitoring and evaluation.

Safety and Tolerability of Artemether/Lumefantrine Combination in Second and Third Trimester of Pregnancy: a non-randomized open label analytical study

OSEDE IGNIS IRIBHOGBE

Email of author: osedeignis@gmail.com

Department of Pharmacology & Therapeutics, College of Medicine Ambrose Alli University Ekpoma, Edo State Nigeria

Background: Artemether/Lumefantrine (AL) is a commonly used fixed dose artemisinin based combination for the treatment of uncomplicated Falciparum malaria in Nigeria. However, the issue of safety of the artemisinin-based combination in pregnancy still occupies a front burner in therapeutics due to limited large scale multicenter studies in this vulnerable population.

Objectives: The study therefore seeks to address the safety and tolerability of the combination as well as elucidate the biochemical and hematological changes associated with its use in pregnancy.

Methods: In the present study, eighty five women in the second and third trimester of pregnancy were recruited from the antenatal clinic of Faithdome Medical Centre Ekpoma Edo State. Of these, forty five were diagnosed with uncomplicated falciparum malaria using rapid diagnostic test (RDT) and Giemsa stained microscopy while the other forty women who were negative for P. Falciparum malaria were used as pregnant control. In addition, thirty five non-malarious nulliparous women were used as non-pregnant control. The study design is a non-randomised open-label study in which the test group was placed on a fixed-dose combination of artemether/lumefantrine (20/120 mg) daily for 3 days. Blood samples were collected on the fourth day post-treatment and the treated group was followed-up consecutively on days 3, 7, 14 and 21. Adverse drug events were monitored and documented and serum lipid, transaminase, bilirubin and hematological indices were evaluated. Data was analyzed using Microsoft Excel 2007 and Graphpad prism 6.0 and one-way analysis of variance was used to compare the mean values between groups. P-value less than 0.05 were taken as the significant level at a confidence interval of 95%.

Results: Result showed that total cholesterol level was significantly (P <0.001) reduced and conjugated bilirubin level though within normal range was significantly elevated in pregnant women treated with AL when compared with apparently healthy pregnant and non-pregnant control. Additionally, serum Alkaline Phosphatase (ALP) was significantly (P<0.001) elevated with a significant (P<0.001) reduction in serum Aspartate transaminase (AST) in pregnant subjects on AL when compared to apparently healthy pregnant and non-pregnant control group respectively.

Conclusions: The study has shown that AL is safe and well tolerated in second and third trimester of pregnancy since no new safety concern were raised by the study. However, elevated biochemical parameters were not clinically significant and are related to physiological changes in pregnancy and not toxicity.

Impact of a pharmacist-driven pharmacovigilance system in a secondary hospital in the Gauteng Province of South Africa

ANTOINETTE TERBLANCHÉ1,2, JOHANNA C MEYER1, ROBERT S SUMMERS1, AND BRIAN GODMAN3,4,5
Email of submitting author: antionette.t@mweb.co.za

1School of Pharmacy, Sefako Makgatho Health Sciences University, South Africa
2Sebokeng Hospital Pharmacy, Sebokeng Hospital, Gauteng Province, Department of Health, South Africa
3Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, United Kingdom; 4Department of Laboratory Medicine, Division of Clinical Pharmacology, KI, Stockholm, Sweden
5Health Economics, Liverpool University Management School, Liverpool University, UK

Background: Spontaneous reporting of adverse drug reactions (ADRs) for hospital inpatients is limited. This is a concern as reporting of ADRs improves future clinical practice. Evidence of a functional pharmacovigilance (PV) system is a requirement in South African (SA) hospitals, hence, the need to evaluate this.

Objective: Evaluate the impact of a structured pharmacist-driven PV system for ADR reporting at Sebokeng Hospital, Gauteng Province.

Methods: Descriptive, operational intervention study of a structured pharmacist-driven PV system for ADR reporting including targeted training at different forums, implemented and monitored over 18 months. Knowledge, attitudes and practices of HCPs were assessed pre- and post-intervention with a self-administered structured questionnaire, along with numbers of ADRs reported. Results were compared using a Fisher Exact test; p<0.05 considered statistically significant.

Results: At baseline (n=131) 19.6% of HCPs were aware of the existing ADR reporting system, 5.3% had received training on ADR reporting and 89.4% indicated the need for training. Post-intervention (n=151) 32.5% of HCPs indicated receiving training during the intervention, 96.6% will support the system and 84.8% understood the need for ADR-reporting. Statistically significant (p<0.001) improvements pre- and post-intervention included: necessity to report ADRs (46.2% vs. 98.0%); previously reported an ADR (12.1% vs. 33.8%); know ADR form available (15.2% vs. 68.9%) and to whom to submit (18.9% vs. 72.8%). Reasons for non-reporting decreased significantly: Not knowing 'how, where and when to report' (p=0.0027); 'Concern that report may be wrong' (34.1% vs. 18.7%; p=0.0041). ADR-reporting increased more than 10-fold: 6 reports (18-month pre-intervention period) to 69 reports (during intervention period).

Conclusions: A pharmacist-driven PV system contributed to better knowledge and attitudes of HCPs and increased ADR reporting. For future interventions, hospital management and policy makers should consider the leadership role that pharmacists can play in improving rational and safe use of medicines in the inpatient setting.

Knowledge and attitudes among healthcare professionals to the reporting of adverse drug reactions at an Academic Hospital, South Africa

MOLIEHI MATLALA, DEIDRE ENGLER, TSAKANE MASHABA, LETHABO MAAKE, ENRICO SHIHAMBI AND TSHIFHIWA NETSHIUNGANI
Email of submitting author: Moliehi.matlala@smu.ac.za

Sefako Makgatho Health Sciences University, South Africa

Background: The knowledge, attitude and practice regarding ADR reporting amongst health care professionals have not been studied extensively in South Africa. A few studies carried out in India and Nepal have shown a lack of knowledge and poor attitude leading to deficient practices of ADR reporting amongst the prescribers and healthcare professionals.

Objectives: The objective of the study was to assess the knowledge and attitudes amongst healthcare professionals towards the reporting of adverse drug reaction at Dr George Mukhari Academic Hospital.

Methods: A descriptive and quantitative study design was followed. Data were collected prospectively using self-administered questionnaires. The population included doctors, pharmacists and nurses. Data was analysed using SPSS version 23 statistics software to calculate the chi-square, means and modes.

Results: The overall response rate was 86.5%. Fifty one percent of the healthcare professionals knew what an ADR was and 83% knew what type of ADR to report. Adverse drug reactions were observed by 73% of the healthcare professionals but only 30% had reported an ADR before. Only 34% of the healthcare professionals were knowledgeable on the procedure to follow when reporting an ADR. The four main reasons selected for not reporting adverse drug reactions were: 23.8% of the doctors and 14.5% of the nurses said the reaction was clinically negligible / trivial; 16.7% of the doctors and 15.3% of the nurses were aware of similar reactions; Fifty three percent indicated lack of clarity on what should be reported, lack of knowledge on the process of reporting and their colleagues not reporting as reasons for the decline in reporting.

Conclusions: The study revealed that the less knowledgeable a healthcare professional was with regards to ADRs, the more negative their attitude. There was lack of knowledge about ADR reporting among HCPs. More training on pharmacovigilance and reporting of ADRs is recommended.

The effect of a pharmacist led training of nurses on intravenous medicine labelling practices at a South African Academic hospital.

HISKIAH PERCY CHEZUBA, MOLIEHI MATLALA AND ANDRIES GOUS
Email of submitting author: hpchez@yahoo.com

Sefako Makgatho Health Sciences University, South Africa

Background: Intravenous (IV) medicines preparation and administration errors do occur and can cause serious harm including deaths amongst hospitalised patients. In South Africa, nurses transcribe doctors' prescriptions to prepare and administer IV medicines and fluids. Such transcriptions require the nurses' knowledge on medicines incompatibilities, infusion rate calculations and IV labelling requirements.

Objectives: The study was conducted with the aim to close the gap between knowledge and practice of nurses on IV infusions labelling.

Methods: A prospective interventional descriptive and quantitative study. The study was conducted in 17 wards in an academic tertiary hospital in South Africa. A baseline study was used as pre-intervention measurement. A pharmacist led training based on the results of baseline study was implemented for all the nursing categories. A checklist used in the baseline study was adjusted and utilised to generate post-intervention data. Pre- and post-intervention data were compared to assess the impact of training on nurses' labelling practice.

Results: During the baseline study, 198 patients' drips were observed for labelling, of these, 75 (38%) had labels. During the post-intervention study 264 patients' drips were observed. Of the 264 observations, 142 (53.8%) had labels. Labelling of patient identification; improved from 90.7% to 99.3%, date medicine was put up; from 80% to 90.1% and witness for labelling; from 37.3% to 41.5%. Labelling of medicine name remained the same with 98.7% pre- and 97.9% post-intervention. There was a decline in labelling of the professional administering the medicine; from 82.7% to 60.1%, indication of the time medicine was started; from 33.3% to 26.8%, medicine concentration; from 30.7% to 19.7% and drip rate; from 5.3% to 2.8%.

Conclusions: The intervention seemed to have significantly contributed to an overall increase of adherence to labelling practice. However, continuous education on the importance of IV infusion labelling is required as a means to reduce medicine errors.

Prevalence and characteristics of medicine use among pregnant women in a Kenyan Hospital

GEORGE M. KIRIRA[1], MARGARET N OLUKA[1], ERIC M. GUANTAI[1], BRIAN GODMAN[2,3,4], CHARLES K. MAITAI[1],
Email of submitting author: georgemurayakirira@gmail.com

[1]*Department of Pharmacology & Pharmacognosy, School of Pharmacy, University of Nairobi, Kenya.*
[2]*Strathclyde Institute of Pharmacy and Biomedical Sciences, Strathclyde University, Glasgow, UK.*
[3]*Department of Laboratory Medicine, Division of Clinical Pharmacology, KI, Stockholm, Sweden*
[4]*Health Economics, University of Liverpool Management School, Liverpool University, UK*

Background: Exposure to certain medicines in pregnancy has been linked to neonatal and maternal adverse outcomes. Published studies have reported widespread use of medications during pregnancy whose safety and effects on the developing foetus are unknown. The extent and characteristics of drug use during pregnancy in Kenya is not well documented.

Objective: To address the lack of knowledge of the extent and the characteristics of medication use during pregnancy in Kenya.

Methods: Hospital based cross-sectional study to determine prevalence and characteristics of medicine use among pregnant women at a Sub County Hospital in Kenya. Data was collected through review of patient files, registers and questionnaire-guided interviews. Descriptive and exploratory data analysis using STATA version 10.

Results: A total of 385 pregnant women were analyzed. Prevalence of OTC, prescription and herbal medicines was 65%, 41% and 11.4%, respectively. The most frequently used US-FDA pregnancy risk category medicine was C at 50%, while categories D and X accounted for 10% and 1.1% respectively. Paracetamol was the most commonly used OTC and prescription medicine whereas ginger was the most frequently used herbal medicine. Co-morbidity was an independent predictor of prescription medication use whilst drug allergy and alcohol consumption were positively associated with herbal medicine use. Urban residence significantly decreased the odds of using OTC medicines.

Conclusions: There was significant use of OTC and prescription medicines in pregnancy amongst this Kenyan population. Appreciable use of herbal medicines and self-medication in pregnancy without documentation was uncovered. Drug allergy, alcohol use, urban residence and co-morbidity were predictors of medicines use in pregnancy. Medication use in pregnancy requires caution and a thorough understanding of possible outcomes particularly on the fetus. There is need for guidelines on risk-benefit analysis among physicians to ensure the future safe use of medications in pregnancy. Programs creating awareness on the dangers of self-medication in pregnancy should be instigated among community pharmacists.

Developing a Pharmacoepidemiology Survey Questionnaire for the Latin American (LatAm) and African Regions

Global Development Committee from the International Society of Pharmacoepidemiology (ISPE), Uppsala Monitoring Center, DURG in Africa and DURG Latin America

MARIBEL SALAS1, STAN EDLAVITCH2, LUCIANE CRUZ LOPES3, ARIEL ARIAS4, ANDY STERGACHIS5, MARIE LINDQUIST6, CHUKA ANUDE7, MACARIUS DONNEYONG8, KWAME APPENTENG9, DANIEL ANKRAH10, MARIA DOLORES RAMIREZ GONZALEZ11, CONSUELO IZAZOLA12,ILSE TRUTER13, HABAB K. ELKHEIR14, NICOLAS THURIN15, RAQUEL HERRERA-COMOGLIO16, LUIS ALESSO17, RIAN MARIE EXTAVOUR18, DIANA GALICIA19, AND WENDY CAMELO CASTILLO20

Email of submitting author: Maribel.salas@merck.com

1Merck Research Laboratories & Adjunct Scholar, University of Pennsylvania
2Department of Psychiatry, University of Missouri School of Medicine, Kansas City.
3Universidad de Sorocaba – UNISO, Universidad Estadual Paulista "Júlio de Mesquista Filho" – UNESP São Paulo, Brasil;
4Centre for Biologics Evaluation, Biologics and Genetic Therapies Directorate, Health Canada, Government of Canada;,
5Professor of Pharmacy & Global Health, Associate Dean, School of Pharmacy, Director, Global Medicines Program, University of Washington;
6Uppsala Monitoring Center, Sweden;
7AstraZeneca Pharmaceuticals, USA;
8Department of Pharmacy Practice and Science, College of Pharmacy, The Ohio State University, Columbus OH., 9Epidemiology Director, Safety Sciences, Pharmacovigilance, Astellas Pharma Global Development, Inc;
10Korle-Bu Teaching Hospital, Korle-Bu, Acrra, Ghana;
11Department of Pharmacology, Universidad Nacional Autonoma de Mexico, Mexico;
12Departamento de Farmacología, Facultad de Medicina, Universidad Nacional Autónoma de México, Mexico;
13Department of Pharmacy, Faculty of Health Sciences, Nelson Mandela Metropolitan University, South Africa;
14Khartoum, Sudan; Claudia Soares, - Glaxo Smith & Kline, USA;
15Bordeaux PharmacoEpi, INSERM CIC1401, INSERM U1219, Université de Bordeaux, Bordeaux, France;
16, Servicio de Farmacovigilancia, School of Medicine, Córdoba National University, Argentina;
17Facultad de Ciencias Médicas, Universidad Nacional de Córdoba, Argentina;
18School of Pharmacy, Faculty of Medical Sciences, The University of the West Indies, St. Augustine campus, Republic of Trinidad and Tobago;
19Facultad de Farmacia, Universidad Autónoma del Estado de Morelos, Mexico;
20Department of Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, USA

Background: Although many advances have occurred in pharmacoepidemiology (PE), the Latin American (LatAm) and African regions have published few articles in this area, and researchers from those regions have limited participation in meetings, regional or multi-national pharmacoepidemiology studies.

Objective: To develop a Pharmacoepidemiology Survey Questionnaire for the Latin American (LatAm) and African Regions to identify the current status, needs, gaps and priorities for PE.

Method: A literature review was conducted to identify PE questionnaires already developed and validated for used in the LatAm and African regions. A questionnaire focused only on pharmacovigilance was identified. As a consequence, we followed the Potter and Brough model for capacity building, and adapted domains from the PV questionnaire. Two electronic questionnaires were developed and will be administered in two phases: the first questionnaire would identify the target population, while the second questionnaire would focus on the technical PE questions. The questionnaire domains include: policy, law and regulation; systems, structures and skills; existence of a PE or pharmacovigilance (PV) Centers, PE training and/or PV; data sources and management; registries in PE, risk assessment; risk management and communication; and use of PE information. The questionnaires were developed in English and translated to Spanish, French and Portuguese. Face validity was carried out with 2-3 experts in the area and native speakers of each language. The target population will include health care providers, as well as representatives from the government, academia, and industry.

Discussion: This survey will contribute to capacity building in the LatAm and African regions by informing the development of training programs, focused on identified gaps and needs.

Medication Adherence and Adverse Effect Profile of Anti-Epileptic Drugs in Nigerian Patients with Epilepsy

JOSEPH FADARE1, TAOFIKI A. SUNMONU[2], IDOWU A. BANKOLE3, ADESOLA ADEKEYE[4], SANNI ABUBAKAR[5]
Email of submitting author: joseph.fadare@eksu.edu.ng

1Department of Pharmacology and Therapeutics, College of Medicine, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria
2Neurology Unit, Department of Medicine,Federal Medical Centre, Owo, Ondo State, Nigeria
3 Neurology Unit, Department of Medicine, Irua Specialist Teaching Hospital, Irua, Edo State, Nigeria
4 Neurology Unit, Department of Medicine,
5 Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State, Nigeria

Background: Medication adherence remains a major challenge among patients with epilepsy (PWE) and it is associated with consequences such as poor seizure control, increased hospitalizations and frequent visits to the emergency. The adverse effect profile of anti-epileptic drugs is one of the main drivers of medication non-adherence.

Objectives: The main objectives of the study were to determine the level of medication adherence among patients with epilepsy (PWE) in some geo-political regions of Nigeria and assess the relationship between adherence and adverse reaction profile of antiepileptic medications used by these patients using the Liverpool Adverse Effect Profile (LAEP)score.

Methods: This was a cross-sectional questionnaire based study among epileptic patients in selected Nigerian tertiary healthcare facilities using the Morisky Medication Adherence Scale and the Liverpool Adverse Effect Profile score.

Results: One hundred and twenty-six patients from four tertiary healthcare facilities were included in this study comprising of 59 (46.8%) males and 67 (53.2%) females. The median duration of drug treatment with anti-epileptic drugs was 20 months. Carbamazepine (104/70.7%), sodium valproate (23/15.6%) and Phenytoin (11/7.5%) were the most commonly prescribed AEDs. Using the Morisky Medication Adherence Scale, 22 (17.2%), 49 (38.3%) and 57 (44.5%) of patients were classified as having high, medium and low adherence respectively. The mean LAEP was 23.69 ± 6.07 with no significant association between it and sex, adherence group, number and duration of AED treatment. The most common reported adverse effects among respondents were tiredness (30.4%), headache (22.5%) and difficulty in concentrating (19.6%).

Conclusions: The results of this study show that medication adherence to AED was poor among patients in this study. While the mean LAEP score indicated good tolerance towards AEDs, there was a tendency towards higher LAEP score among patients taking phenobarbital and its combination with other AEDs.

Prescription patterns and adequacy of blood pressure control among adult hypertensive patients in Kenya; findings and implications

JENNIFER M. MBUI1, MARGARET N. OLUKA1, ERIC M. GUANTAI1, KIPRUTO A. SINEI1, LOICE ACHIENG2, AMANJ BAKER3, BRIAN GODMAN4
Email of submitting author: mbuijennifer@gmail.com

1Department of Pharmacology and Pharmacognosy, School of Pharmacy, University of Nairobi, Nairobi, Kenya
2Department of Medicine, University of Nairobi, Nairobi, Kenya
3Strathclyde Institute of Pharmacy and Biomedical Sciences, Strathclyde University, Glasgow, UK.
4Department of Laboratory Medicine, Division of Clinical Pharmacology, Karolinska Institutet, Stockholm, Sweden

Background: Hypertension is a major cause of morbidity and mortality across countries, with high prevalence rates in Africa including Kenya (up to 55% of the adult population). Consequently, it is imperative to understand current treatment approaches and their effectiveness.

Objective: Describe current prescribing patterns and adequacy of blood pressure (BP) control among adult hypertensive patients in Kenya.

Methods: A descriptive cross-sectional study conducted in a sub-county medical out-patient clinic between January and April 2015 using a mixed-method approach. Quantitative data of anti-hypertensive therapies and BP control collected via retrospective analysis of patients' medical records. A semi-structured interview guide was used to collect qualitative data from prescribers. Quantitative data were analysed using STATA 10. Analysis of interviews was undertaken by grouping discerning patterns or themes.

Results: A total of 247 hypertensive patients, predominantly female, with a mean age of 55.8 years, on antihypertensive therapy for 1-5 years were analyzed. Angiotensin converting enzyme inhibitors (ACEIs) and thiazide diuretics were the most commonly prescribed anti-hypertensive medicines, mainly as combination therapy. Treatment typically complied with current national Kenyan guidelines, mainly for stage 2 hypertension (75%). Control of BP was observed in 46% of the patients, with a significant reduction in mean systolic (155 to 144 mmHg) and diastolic (91 to 83 mmHg) BP (P<0.001) from diagnosis to the last clinic visit. Patients on ≥2 antihypertensive drugs were more likely to have uncontrolled BP (OR:1.9, p=0.021). Prescribers had been trained on the guidelines enhancing compliance. Most common challenges were poor adherence to medications, cost of medications, and inadequate patient counselling.

Conclusions: Encouragingly, good compliance to current guidelines due to training. Poor BP control in the majority needs to be addressed. Additional training of prescribers and follow-up of measures to improve BP control to be instituted and followed-up.

Health-related quality of life and associated factors among patients with diabetes mellitus in Botswana

RWGERERA GM1, MOSHOMO T2, GAENAMONG M2, OYEWO TA3, GOLLAKOTA S3, YORDANKA RIVERA YP1, MASAKA A4, GODMAN B5,6,7, SHIMWELA M8 HABTE D9
Email of submitting author: grwege@yahoo.com

1Faculty of Medicine, University of Botswana, Botswana
2Ministry of Health, Botswana,
3Princess Marina Hospital, Gaborone, Botswana
4Botho University, Gaborone, Botswana
5Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK
6Health Economics Centre, Liverpool University Management School, Liverpool, UK
7Division of Clinical Pharmacology, Karolinska Institute, Stockholm, Sweden
8Amana Municipal Hospital, Dar es Salaam, Tanzania,
9Management Sciences for Health, Ethiopia

Background: Health-related quality of life (HRQOL) is an important aspect of diabetes mellitus care as it has been consistently shown that poor quality of life is associated with diminished self-care, poor glycemic control, increased complications and increased mortality. However, little is currently known about HRQOL among Diabetes mellitus (DM) patients in Africa.

Objectives: We aimed to determine the health-related quality of life (HRQOL) of DM patients in Botswana using the Short Form (SF-12) survey instrument and examine which patients' socio-demographic and clinical characteristics are associated with worse health-related quality of life.

Methods: A cross-sectional study of 380 randomly selected DM patients in a tertiary clinic in Gaborone, Botswana. Data on HRQOL and a structured questionnaire on sociodemographic and clinical characteristics were used to collect the data. Multivariate logistic regression analyses were performed to determine the sociodemographic and clinical characteristics associated with HRQOL in these patients.

Results: The majority of patients were female with no formal education or primary level of education. Mean HbA1c was 7.97% (SD: 2.02) and most patients had poor glycemic control. The majority of patients had both worse physical composite scores (PCS-12) and mental composite scores (MCS-12), with worse proportions of the two. Female gender (p-value = 0.023, AOR=1.95; 95% CI= 1.09, 3.48); older age ≥ 65 years (p-value = 0.015, AOR=2.43; 95% CI = 1.18, 4.99); and presence of three or more documented diabetic complications (p-value = 0.002, AOR= 3.47; 95% CI= 1.56, 7.71) were associated with significant worse PCS-12. Presence of two diabetic complications (p-value= 0.028, AOR=2.40; 95% CI= 1.09, 5.26), three or more diabetic complications (p-value= 0.000, AOR=5.37; 95% CI=2.41, 11.96) and presence of documented musculoskeletal disease (p-value=0.020, AOR=2.52; 95% CI= 1.15, 5.52) were associated with significant worse MCS-12

Conclusions: Diabetic patients in Botswana have relatively poor HRQOL. The fact that most patients present late with complications calls for policy attention to diagnose diabetes mellitus early and prevent associated complications, ultimately improving the health-related quality of life among diabetes mellitus patients in Botswana.

Adverse drug events in inpatients in internal medicine ward in Katutura Intermdiate Hospital, Namibia

THOMAS T E1, AND KALEMEERA F2
Email of submitting author: taleni.tt@gmail.com

1School of Medicine, Faculty of Health Sciences, University of Namibia
2School of Pharmacy, Faculty of Health Sciences, University of Namibia

Background: Most adverse drug reaction (ADR) reports come from outpatient settings, as such there is little information on ADR at the in-patient level. The objective of this study was to find out the type and grade of ADR that occurred in in-patients in internal medicine wards in Katutura Intermediate Hospital, and to see what to assess the actions taken when these ADRs occurred.

Methods: This study used a retrospective method. All patients who were admitted to ward 5B during the month of May 2016 were included. The patients' files were the source of all the data that was gathered and analysed. The data from the patient' file were the times the patient was admitted, the complaints presented at the time of admission, the drugs the patient received during admission, and new complaints raised after initiation of drug therapy. The WHO method of causality assessment was used.

Results: Of the admitted patients 13% were male and 87% female. A total of 11% of the patients developed ADR, and of these 14% occurred in males, while 86% occurred in females. Of the total ADR, gastrointestinal-related ones constituted 33%; and central nervous system-related ones made up 34%. Most of the ADR were resolved, but 7% were persistent at the time of discharge. None of the ADRs that were recorded were serious.

Conclusion: ADRs are an important, often preventable cause of long hospital stay and inpatient morbidity in many Countries. It is critical for ADR to be identified quickly and appropriate measures be put in place to mitigate them. The ones that were we observed were mild, and many had resolved; however, it is necessary that at the time of discharge the ADR must be properly managed so as to reduce patient morbidity.

Patient knowledge regarding medicine management of type-2 diabetes among patients attending Community Health Centres in South Africa

AFSANA MOOSA1, SELENTE BEZUIDENHOUT1, JOHANNA C MEYER1, AND BRIAN GODMAN2,3,4
Email of submitting author: afsanamoosa@gmail.com

1Sefako Makgatho Health Sciences University, South Africa
2Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK,
3Division of Clinical Pharmacology, Karolinska Institutet, Stockholm, Sweden;
4Health Economics Centre, Liverpool University Management School, Liverpool University, UK

Background: Diabetes mellitus, with a prevalence of 1 in 10 adults, is amongst others the leading global risk for mortality in the world. In South Africa, diabetes mellitus ranks third after ischaemic heart disease and cancer in terms of morbidity and mortality. It is also the most prevalent condition treated at Laudium Community Health Centre (CHC). Patient knowledge regarding medicine management of diabetes type-2 is important as it can play a role in controlling the disease.

Objectives: Assess the knowledge of patients with type-2 diabetes regarding the management of diabetes attending a CHC in Pretoria, South Africa

Methods: Descriptive, quantitative cross-sectional design. Data were collected by means of patient exit interviews using structured questionnaires at a CHC in Pretoria, South Africa. The sample included 217 adult (≥ 18 years) diabetes type-2 patients who have visited the doctor as well as the pharmacy. Face-to-face patient exit interviews were conducted using a structured questionnaire.

Results: Females were predominant (65%) in the study. The majority of patients were >60 years and 51% of patients were from the Indian racial category. Most patients (79.3%) did not know how their medication controls their type-2 diabetes. 84% of patients did not know any side effects for their medication. Less than 50% of the patients knew how to take their medication and more than a third of the patients indicated that they were not practicing any form of self-care.

Conclusions: The results indicated that patients lacked sufficient knowledge regarding the management of type-2 diabetes. This is critical as self-care including adherence to medication is vital to help control type-2 diabetes and prevent progression of complications including CV disease, neuropathy and nephropathy. Health care managers should consider programmes to capacitate patients with knowledge about the management of their disease to improve future control.

A longitudinal study into the dispensing patterns of benzodiazepines and z-drugs in a South African private healthcare setting

ILSE TRUTER1, THERESE KAIRUZ2, AND THEUNIS J VAN W KOTZE3
Email of submitting author: ilse.truter@nmmu.ac.za

1Drug Utilization Research Unit (DURU), Nelson Mandela Metropolitan University, South Africa
2University of Newcastle, Australia
3Drug Utilization Research Unit (DURU), Nelson Mandela Metropolitan University, South Africa

Background: Benzodiazepines, including the z-drugs, have anxiolytic, sedative, hypnotic and muscle relaxant effects and are used to treat anxiety, panic and sleep disorders. There is a variety of branded generics of these drugs available on the South African market. The aim was to compare the prescribing patterns of these drugs in a South African private sector patient population over a 12-year period (analyses were conducted on data collected in 2004, 2010 and 2015).

Methods: A retrospective, cross-sectional drug utilisation study was conducted on three datasets of benzodiazepines and the z-drugs dispensed in 2004 (27080 records), 2010 (32775 records) and 2015 (30727 records) in South Africa. Data were obtained from a private medical aid administrator. Main outcome measures were dispensing frequency of active ingredients and generic substitution.

Results: Twenty-one different active ingredients of benzodiazepines and the z-drugs were prescribed. On average over the time period, zolpidem (16.53%) was the most often prescribed active ingredient, followed by alprazolam (14.78%), diazepam (13.86%), zopiclone (11.36%) and midazolam (10.30%). These five active ingredients accounted for 66.83% of benzodiazepine and z-drug prescriptions in 2005, 2010 and 2015. These three benzodiazepines were also the products with the most generic equivalents available. Diazepam and midazolam each had seven branded generics that were dispensed in 2015, and alprazolam had six generics. Midazolam and zolpidem dispensing were the most heterogeneous (Stddev.P of 6.44 and 4.35, respectively). Zolpidem and lorazepam showed an increase in prescribing, whilst bromazepam, oxazepam and temazepam showed a decrease.

Conclusions: From 2004 to 2015 the prescribing frequency of diazepam decreased and alprazolam, although not directly related, increased, and zopiclone was replaced by zolpidem as the z-drug of choice. Less expensive generic equivalents had a substantial impact on dispensing patterns in this 12-year period and have established a firm place in this sector of the pharmaceutical market.

Trends in the incidence and prevalence of bipolar disorder in the private health sector of South Africa, 2010-2015

MARTIE S LUBBE, PAUL ADEBAYO, JOHANITA R BURGER, MARIKE COCKERAN,
Email of submitting author: Martie.lubbe@nwu.ac.za

Medicine Usage in South Africa, North-West University, Potchefstroom, South Africa

Background: There has been a relative dearth of epidemiological research into bipolar disorder in South Africa.

Objectives: To determine trends, over a 6-year study period, in the incidence and prevalence of bipolar disorder in the private health sector of South Africa.

Methods: We conducted a retrospective, open cohort study, analysing nationally representative medicine claims data, January, 1, 2010 to December, 31, 2015. Only patients diagnosed with bipolar disorder, as indicated by the ICD-10 code F30 were included in the study. The incidence rate per 1000 beneficiaries were determined with 2010 as index year. The total patient populations for the respective years were: 968 131 (2010), 864 962 (2011), 815 792 (2012), 809 838 (2013), 838 618 (2014) and 843 792 (2015).

Results: Bipolar disorder patients represented 0.6% (2010) to 0.8% (2015) of the total patient population on the database. The prevalence of bipolar disorder per 1000 beneficiaries increase from 5.9 in 2010 to 7.9 in 2015. The majority of patients were females, with an average age of 43.6 ± 15.8 years (95% CI 43.2 – 44.0) at index year. The incidence rate per 1000 beneficiaries stayed nearly the same during the study period, 2.3 in 2011 *vs.* 2.1 in 2015. Higher incidence rates per 1000 beneficiaries (2.9 in 2011 *vs.* 2.6 in 2015) were found for females than males (1.7 in 2011 *vs.* 1.6 in 2015).

Conclusions: Although the incidence of bipolar disorder stayed nearly the same through the study years, the medical scheme environment in South Africa should be concerned about an increased trend in the prevalence thereof.

Prevalence of coexisting non-communicable diseases in bipolar disorder patients in the private health sector of South Africa, 2010-2015

MARTIE S LUBBE, PAUL ADEBAYO, JOHANITA R BURGER, MARIKE COCKERAN,
Email of submitting author: Martie.lubbe@nwu.ac.za

Medicine Usage in South Africa, North-West University, Potchefstroom, South Africa

Background: Bipolar disorder is a recurrent and chronic mental illness. It is associated with functional impairment and the existence of other non-communicable chronic diseases in these patients may represents a unique public health problem.

Objectives: To investigate trends, over a 6-year study period, in the prevalence of coexisting non-communicable chronic diseases in bipolar patients in South Africa.

Methods: We conducted a closed cohort study, analysing data of 1228 bipolar patients (ICD-10 code F30), obtained from a nationally representative pharmaceutical benefit management company, 1 January 2010 - 31 December 2011. The chronic disease list (CDL) of South Africa, based on the ICD-10 codes, was used to identify the non-communicable diseases.

Results: Over the 6-year study period the total number of bipolar patients with one or more coexisting non-communicable diseases increased with 17% (n=103). However, we did not observe a practically significant increase in the mean number of coexisting non-communicable conditions per bipolar patient over the study period (p<0.05; d<0.8). The most common non-communicable conditions co-occurring with bipolar disorder for all study years were hypertension, hyperlipidaemia, hypothyroidism, type 2 diabetes, epilepsy and asthma.

Conclusions: This study may contribute to the body of evidence about the prevalence of coexisting non-communicable diseases in bipolar disorder patients in the South African private health sector.

Initiatives to increase the prescribing of low cost generics across countries and the implications

BRIAN GODMAN1,2, AMANJ BAKER KURDI2, MARGARET OLUKA3, JOSEPH FADARE4, DAN KIBUULE5, AMOS MASSELE6, AND ILSE TRUTER7
Email of submitting author: Brian.Godman@ki.se

1Division of Clinical Pharmacology, Karolinska Institute, Stockholm, Sweden
2Strathclyde Institute of Pharmacy and Biomedical Sciences, Glasgow, UK
3University of Nairobi, Kenya
4Department of Pharmacology and Therapeutics, College of Medicine, Ekiti State University, Ado-Ekiti, Nigeria
5Department of Pharmacy Practice and Policy, Faculty of Health Sciences, University of Namibia, Windhoek
6University of Botswana School of Medicine, Gabarone, Botswana
7Drug Utilization Research Unit, Department of Pharmacy, Nelson Mandela Metropolitan University, South Africa

Background: Getting the most out of the pharmaceutical budget, including obtaining low prices for good quality generics, is critical across all countries as the financial pressures on healthcare systems intensify alongside the strive for universal access. There are examples across countries of successful ways of encouraging the use of low cost good quality generics versus branded pharmaceuticals, including originators and patented products in the same class, while ensuring care is not compromised.

Objectives: Appraise pertinent publications among European countries as well as other high income countries, including Abu Dhabi, Japan and the USA, as well as other low and middle income countries including African countries

Methods: Retrospective review of published papers involving the co-authors and others that have assessed the influence and impact of policies to enhance the utilisation of generics

Results: Prices of good quality generics can be as low US$1/patient/ month (Novartis Access Programme in Kenya). Based on multiple publications, including several case studies, achieving efficiency in pharmaceutical spending is possible in virtually all environments, although there are examples of medicines where generic or therapeutic substitution should not be encouraged. This includes medicines such as lithium and some medicines for epilepsy. There is now less controversy surrounding International non-proprietary name (INN) prescribing for medicines for immunosuppression. However, quality of generics is important to achieve high INN prescribing as advocated by WHO and seen in Scotland and Botswana. There is no magic bullet to achieving full and appropriate use of generics. Countries have to be prepared to use a number of different strategies to increase generic prescribing including QIs to achieve success. Similarly, different approaches are being used to achieve low prices for good quality generics.

Conclusions: The combination of low prices and increased use of generics will help achieve or attain universal healthcare, benefiting all key stakeholder groups. There is a need for greater cross-country learning in pursuit of what should be a common goal for all health systems.

Students' perception of the perceived availability and diversion of methylphenidate in a South African tertiary academic institution

JOHANITA BURGER1, JESSICA DREYER1, IRMA KOTZE1, SANDRA VAN DYK2, AND MARIKE COCKERAN1
Email of submitting author: Johanita.Burger@nwu.ac.za

1Medicine Usage in South Africa (MUSA), North-West University, Potchefstroom, South Africa.
2School of Pharmacy, North-West University, Potchefstroom, South Africa

Background: Despite strict control over methylphenidate, it seems to be readily available for non-medical use. Diverting methylphenidate has several implications, such as patients not benefitting from their therapy and requiring additional medical care due to complications.

Objectives: The aim of the study was to determine where residence students from a South African tertiary institution get methylphenidate for both appropriate and non-medical use, where they think they could get it and how easy they think it is to acquire.

Methods: This quantitative cross-sectional study gathered data using a structured questionnaire. Data were collected during May 2015. Ten residences (five sororities and five fraternities) from a tertiary academic institution housing approximately 2400 students, were randomly selected to partake in the study. The response rate was 13.7%. The questionnaire had 23 items that related to demographic characteristics, methylphenidate use behaviours and perceptions, and knowledge of methylphenidate. The questionnaire was originally adapted from the previously validated Behaviours, Expectancies, Attitudes and College Health Questionnaire.

Results: The mean age of the participants was 20.1 years and 56.4% of the sample was female. Although all the appropriate users have obtained methylphenidate legally at least once, they have also obtained it illegally from their friends (30.8%) and family (7.7%). The most common source for non-medical users was their friends (77.3%). Non-medical users also acquired methylphenidate using fabricated prescriptions (10.7%) and by buying it from pharmacies without a prescription (14.3%). Users and non-users had similar perceptions of where they thought they could get methylphenidate, except that users were more likely to think they can get it from friends (67.1% *vs.* 46.7%).

Conclusions: The current study presents novel evidence for methylphenidate diversion by university students in South Africa. Considering the abuse potential of methylphenidate, the diversion should be further explored and programmes developed to improve the legal control of methylphenidate.

The Effect of Patient Knowledge on Blood Glucose Levels: A Focused Study on Type II Diabetic Patients

WEDER L1, AND KALEMEERA F2
Email of submitting author: liezlwdr06@gmail.com

1School of Medicine, Faculty of Health Sciences, University of Namibia
2School of Pharmacy, Faculty of Health Sciences, University of Namibia

Objective: This research aimed to investigate the link between knowledge of diabetes type II by the patient and how it affected their health outcomes in terms of adherence based on their levels of blood glucose. The specific objectives were to determine whether patients' knowledge of diabetes mellitus type II had an impact on their blood glucose levels and to determine whether patients' knowledge of diabetes mellitus type II improved their management as reflected by their health in general.

Method: It was a cross sectional study. It was of a survey method and both a quantitative and qualitative study. A questionnaire comprised of multiple choice questions was used, which included a space for readings of respondents' blood glucose levels that were taken by a nurse, as well as their blood pressure, weight and height.

Results: The total number of respondents in the study was 45 of which 33 were female and 12 were male. There were a total of 29 middle aged respondents and only 16 respondents were old. 47% were unemployed and majority came from the lower income class level. Only 26 respondents had attended primary school, 12 attended high school while 6 sought qualifications at a technical college and only 1 respondent went to university. Data showed 32 respondents had family support present and 76% had a family member who had diabetes as well. BMI calculations showed 49% of respondents were overweight, 20% were obese and 16% were or normal weight. Results further showed only 12 respondents had ever been admitted to hospital for diabetic complications. Fifteen (n=15) respondents had controlled blood pressure and 30 respondents had uncontrolled blood pressure. Twenty eight (n=28) respondents had bad glucose control while 17 had good control. Pearson correlation value of glucose level to level of knowledge was R=0.28 and chi-squared p-value of the relationship of overall health to level of knowledge was p=0.53.

Conclusion: No correlation existed between glucose control and level of knowledge and no statistical significance between the level of knowledge and overall health of diabetic type II patient

Assessment of knowledge, attitude, practices of pregnant women toward PMTCT at an antenatal care unit

INDONGO E1, AND KALEMEERA F2
Email of submitting author: etuuva1992@gmail.com

1School of Medicine, Faculty of Health Sciences, University of Namibia
2School of Pharmacy, Faculty of Health Sciences, University of Namibia

Introduction: The Human Immunodeficiency virus (HIV) infection continues to be a global health problem. Nearly 1800 new HIV infections occur in children under 15 years of age daily, more than 90% being associated with mother-to-child transmission (MTCT). The prevention of mother-to-child transmission (PMTCT) intervention was designed to minimise transmission. As such pregnant women need to be knowledgeable of PMTC. This study was designed to assess the knowledge, attitude, and behaviour of pregnant women towards PMTCT.

Method: This was a cross-sectional study, conducted at the Antenatal Care Unit of Katutura Intermediate Hospital between 31 May and 1 April 2015, following Ethical Approval from the Ministry of Health and Social Services: Namibia. Structured questionnaires were used to collect information from the respondents. Data were stored on a password protected computer. Frequency tables were generated and used to describe the findings on knowledge, attitude and practice. Independent variables such as knowledge, age, parity status, and education status were assed for association with dependent variables such as attendance of the clinic and administration of PMTCT drugs. Also, associations between independent variables were studied. For these associations the Chi-Square and Cramer's V statistical tests were used. The confidence level was set at a p-value <0.05 and the confidence level at 95%.

Results: There were 112 respondents, all being pregnant women. The majority (n=80, 71.4%) were 20 - 30 years of age, and many were unmarried (n=100, 89%). All had been through grade school (7th grade, n=1; 8th-12th grade, n=100; and Higher Education, n=11). The majority (n=70) were unemployed, while the minority (n=14) were self-employed. Of the total, 49.1% (n=55) and 50.9% (n=57) were para-1 and multi-para, respectively. In regards to knowledge, <10% reported not to know about MTCT; >10% reported not to be aware of HIV transmission via breastfeeding and the risk of transmission without PMTCT; and >20% said they did not know about the different prevention methods including antiretroviral-based PMTCT. Of note, none (0.0%) of them reported church criticism of PMTCT. The majority (66.1%) expressed a negative attitude towards voluntary counselling and testing, while more than 80% had a good attitude towards involvement of male partners in ANC. In regards to behaviour, 49% reported to attend ANC/PMTCT services; 26% reported to have missed their PMTCT medicines; and 35% said they were using alcohol. Gravidity had no association, while age and educational status had a positive association with knowledge of MTCT (p=0.495 and P<0.05, respectively).

Conclusion and Recommendation: There was generally good knowledge, attitudes, and practices amongst the correspondents. Nevertheless, the minority that displayed lack of knowledge in some areas pertaining to MTCT and PMTCT represent a section of vulnerable people. There needs to be strengthening in the area of patient information. Another area that raises concern is the negative attitude towards voluntary counselling and testing amongst the majority of patients. One needs to investigate why this negative attitude exists, yet the majority expressed knowledge of PMTCT and the risk of transmission if PMTCT was not implemented.

A cost-effective model for monitoring medicine use in Namibia: outcomes and implications

KIBUULE DAN[1], LATES JENNIE[1]; KAGOYA R. HARRIET[2*], PHULU BAYOBUYA[2], NIAZ QAMAR[3], RENNIE TIMOTHY[1]

1School of Medicine, Faculty of Health Sciences, University of Namibia
2SIAPS, Management Sciences for Health: Namibia
3Division: Pharmaceutical Services, Ministry of Health and Social Services

Background: Routine monitoring of medicine use is costly. Medicine use monitoring in most low and middle income countries is heavily reliant on donor support, which is not sustainable. Innovative models to close gaps in monitoring of medicine are critical towards strengthening pharmaceutical services.

Objectives: Pilot an inter-institutional collaborative model for monitoring medicine use in Namibia.

Methods: Descriptive cross-sectional intervention design. Three key stakeholders - Ministry of Health and Social Services (MoHSS) division of pharmaceutical services, UNAM-School of Pharmacy (UNAM-SoP) and USAID-funded SIAPS project collaboratively designed and implemented a concept model, tools and guidelines for medicine use assessment. Medicine use was assessed annually using the WHO/INRUD indicators. Pharmacy students collected medicine use data under supervision of MoHSS pharmacists. UNAM-SoP with technical assistance from SIAPS aggregated the reports and reported to the MoHSS. Data collected by the students on hospital placements were entered in an Microsoft Excel® template for descriptive analysis for patient care indicators. Students discussed their findings with health facility supervisors.

Results: The collaborative efforts enhanced the institutional and students' capacity on analysing, reporting and presentation of data on medicine. A total of three medicine use surveys involving over 1,938 patients were conducted from 2013 to 2015. The local capacity to conduct MUE was increased among 74 pharmacy students. At least 15 public hospitals in 12/14 regions participated in the MUE. Findings reveal 83% of prescribed medicines were dispensed; 53-57% patients were satisfied with medicines information; 50-59% of patients felt they waited too long (consultation time of more than 3 hours) before getting their medicines; over 80% patients did not know how to take their medicines correctly; 56-80% of dispensed medicines were labelled correctly.

Conclusions: A multi-sectoral collaborative models are cost-effective in medicine surveys. Student placements provide an opportunity to build local capacity for routine MUE. Ministries of Health should utilise this innovative approach to assess service delivery.

Access to smoking cessation pharmacotherapy services in Namibia: A KAP study among medical doctors

E.N NAIKAKU[1], K AMAKALI[2], A SHILUNGA[2], D KIBUULE[1]
Email of submitting author: enaikaku@unam.na

1School of Pharmacy, Faculty of Health Sciences, University of Namibia, Namibia
2School of Nursing, Faculty of Health Sciences, University of Namibia, Namibia

Background: Smoking is a major risk factor for non-communicable diseases and remains a significant public health problem in many lower and middle income countries (LMIC). Unfortunately public access to smoking cessation services in LMIC such as Namibia remains is limited and costly. Inspite that smoking cessation (SC) pharmacotherapy significantly reduces poor outcomes; its implementation in medical practice in Namibia is unknown.

Objectives: To assess the knowledge, attitudes and practices of pharmacotherapy for smoking cessation among medical doctors in Khomas region, Namibia.

Methods: A cross-sectional analytic study design was conducted among medical doctors in both the private and public settings in Khomas region. Data on knowledge, attitudes and practice of SC pharmacotherapy were collected using a self-administered questionnaire and entered in SPSS v23 for descriptive quantitative analysis and associations using Chi-squared test and T-test. Qualitative data were analyzed thematically.

Results: A total of 106 doctors participated; majority were general medical practitioners (60%), practiced in public facilities 73(69%), of the age category, 30-40 years (40%) and non-smokers (99.1%). Out of the 71(66%) doctors who offer smoking cessation services; 25% had good knowledge on the SC pharmacotherapy, 93% provide SC counselling services and 32% prescribe SC medications. NRTs (53%) and Bupropion SR (41%) are the most prescribed SC medications. Doctors in the private sector had better knowledge (p=0.011) and prescribed (p=0.007) SC pharmacotherapy more frequently than in the public sector. Majority of the doctors, 93(88%) had excellent attitude towards SC pharmacotherapy. Main barriers to provision of SC pharmacotherapy were – lack of competence and/or policy framework.

Conclusion: Study concludes that despite the good attitude towards SC pharmacotherapy, knowledge and practice of remains limited among medical practitioners particularly in the public sector. There is a need for a policy frame work for provision of SC services and pharmacotherapy as part of the essential primary health care package.

Key recommendations: The study recommends the inclusion of smoking cessation medicines in the national standard treatment guidelines and to improve doctor's knowledge and practices via training and education.