

VIRTUAL ABSTRACT PRESENTATION

WA 001 V

***In-vitro* bioequivalence assay of some different brands of ciprofloxacin**

Ogira J. Ogwuiche¹, Odoh R. Onyema²

¹Department of Pharmaceutical Chemistry, Faculty of Pharmacy. Bingham University, Karu Nasarawa State Nigeria.

²Departments of Political Science, University of Jos, Plateau State Nigeria.

Email: oguche.ogira@binghamuni.edu.ng, ogirajohnson@gmail.com

Background: Ciprofloxacin is a quinolone derivative antibiotic produced through structural modification by addition of the 7-piperazinyl group and a fluoride atom on the quinolone molecule. It has a broad spectrum of activity against both Gram-positive and Gram-negative bacteria.

Objective: The main was to study the equivalence of different commercial brands of ciprofloxacin tablets using UV-Vis and HPLC.

Methods: In this study, the innovator brand and five other brands of ciprofloxacin hydrochloride 500mg tablets were subjected to different assays such as UV-Vis, HPLC analysis and anti-microbial screening.

Results: The results for the UV-Vis analysis showed highest peak of absorbance at 280nm for brand A, and 280nm for brands B, C, D, E, and F for the HPLC analysis, the retention time for brands A, B, and C were seen as 1.781 minutes, and brand D, E, and F as 1.782 seconds. All the brands except brand B passed UV-Vis and HPLC analysis which is in line with the pure ciprofloxacin used as standard. Brand B had the lowest efficacy against the different strains of bacterial during the anti-microbial test.

Conclusion: The study concludes that the different brands of ciprofloxacin were equivalent except brand B which veered off the limit during the anti-microbial test.

Key Words: Ciprofloxacin, HPLC, Antimicrobial test, UV-Vis analysis, quality assessment.

WA 002 V

Assessment of community pharmacists' knowledge, perception and practices regarding antimicrobial stewardship: a cross-sectional study in Ebonyi State

O.M. Ugwu¹, K.C Amorha²

¹Alex Ekwueme Federal University Ndufu Aliku Ikwo, Medical Center

²Department of Clinical Pharmacy and Pharmacy Management, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka

Email: maureenhills25@yahoo.com

Background: Antimicrobial Stewardship (AMS) refers to programmes and interventions aimed at optimizing antimicrobial use. Implementation and introduction of majority of AMS programmes has been successfully conducted in institutional settings. However, community pharmacy practices are deprived of such efforts.

Objectives: The objective of the study was to evaluate community pharmacists' knowledge, perception and practice regarding antimicrobial stewardship (AMS).

Methods: The study instrument was a 33-item structured questionnaire in five domains: demographic details, awareness of AMS, knowledge of AMS, perceptions about AMS and practice regarding AMS. Data was analyzed using the IBM SPSS Version 25.0. Descriptive statistics were used to summarize data. Pearson's Chi-Square was used to test the association between variables with level of significance set as $P < 0.05$.

Results: Majority of the respondents were between 26 and 45 years old (72.9 %), males (68.6 %) and had ? 10 years' community pharmacy experience (77.1 %). More than half of the respondents (81.4 %) were aware of AMS. Overall, more than half of the respondents (72.9 %) had good knowledge of AMS while about half of them (54.3 %) had positive perception of AMS and good AMS practice (51.4 %). All the respondents who are fellows (FPCPharm) had good knowledge and positive perception of AMS compared to those who were not Fellows of the College (100.0 % vs. 67.8 %), (81.8 % vs. 49.2 %).

Conclusion: Pharmacists in Ebonyi State need to continually update their knowledge of AMS and also improve inter-professional collaborations so as to optimize health outcomes.

Keywords: Antimicrobial stewardship, antimicrobial resistance, pharmacist

WA 003 V

Attitude of health workers toward covid-19 patients and vaccine uptake in five selected hospitals in Federal Capital Territory, Abuja.

Kenneth Ugwuja

Faculty of Public Health, West African Postgraduate College of Pharmacists

Email: ugwujakenneth2020@gmail.com

Background: Coronavirus 2019 (COVID-19) is a global health threat and an international public health emergency. The attitude of health workers towards COVID-19 patient is important in the spread of the disease, whereas vaccine uptake will minimize the morbidity rate of the pandemic.

Objectives: To determine the attitude of health workers toward COVID-19 patients and vaccine uptake in five selected hospitals in the Federal Capital Territory, Abuja.

Methods: Cross sectional descriptive study with a pretested questionnaire with Likert type question was administered to 450 health workers. The data was analyzed using test statistics (t-stat) using SPSS version 24.

Results: A total of 396 out of 450 (88%) questionnaires were returned with more female respondents (58.3%) than male (46.2%). The study revealed that majority (52.5%) perceived that COVID-19 patients were not stigmatized during the pandemic with 51.7% of suspected cases of COVID-19 patients complying with the safety protocol. However, 90.4% of respondents opined that COVID-19 vaccine should be made voluntary, necessitating them to recommend the vaccine to their family (60.8%), friends (67.1%) and colleagues (66%).

Conclusion: The results obtained from the study show that there is positive attitude of health workers towards COVID-19 patients as well as vaccine acceptance among health workers.

Keywords: Attitude, COVID-19 patients, Vaccine uptake, Health workers

WA 004 V

A study to assess the knowledge and skills of pharmacists in Ghana on pharmaceuticals used in Bloodless Medicine and Surgery strategies

Samson Kraikue-Quaicoe¹, Haruna Ahmed Jambedu²

¹Clinical, Pharmacy Practice & Research, Curriculum Development, Kraspect Institute of Professional Studies, Takoradi-Ghana.
E-mail: kwamekraikue@yahoo.co.uk

²Clinical Pharmacy Unit, GHAPPHA Hospital, Takoradi-Ghana

Background: The scarcity and safety concerns on the use of allogeneic blood led WHO to recommend the implementation of Patient Blood Management (PBM) strategies or Bloodless Medicine and Surgery (BMS). As major stakeholders, pharmacists need requisite knowledge and skills in use of pharmaceuticals used in BMS ("Haemopharmaceuticals").

Objectives: To assess the knowledge and skills of pharmacists in the use of BMS, availability and use of "haemopharmaceuticals", identify gaps in knowledge and skills among pharmacists in BMS and to propose possible amendments to training of pharmacists.

Methods: A semi-structured survey was conducted using electronic questionnaires on all 16 regional pharmacists' WhatsApp platforms with a sample size of 100 participants involved in the study for a duration of 90 days.

Results: About half of the participants (43%) did not have knowledge about BMS. Majority (92%) had knowledge on the use of haematinics. A few had knowledge on the use of antifibrinolytics (2%), crystalloids (2%) and erythropoiesis stimulant agents (1%). Approximately, a quarter (22%) had no knowledge of the mechanism of action (MOA) while nearly half (43%) indicated having some knowledge of their MOA as used in BMS. "Haemopharmaceuticals" were unavailable in more than half (58%) of facilities. 73% of pharmacists lacked the requisite knowledge and skills in using "haemopharmaceuticals".

Conclusion: A significant number of pharmacists do not have adequate knowledge and skills for implementation of BMS strategies thereby limiting their role as primary stakeholders in providing technical expertise and oversight in BMS.

Keywords: Pharmacists, Bloodless Medicine and Surgery, Patient blood management, "haemopharmaceuticals"

WA 005 V

The use of social media in pharmacy education: an assessment of the opinions of the students of West African Postgraduate College of Pharmacists (WAPCP) in Nigeria.

Grace L. Kolo, Ene O. Daniel-Ebune

Pharmacy Council of Nigeria, Idu, Abuja.
Email: grace.laraba@gmail.com

Background: With the advent of the coronavirus disease in 2019 (COVID-19), every facet of life has been dramatically affected. Preventive measures were advocated to curtail the spread of the disease, which promoted the use of online platforms to minimize physical interactions. Following this trend, the West African Postgraduate College of Pharmacists (WAPCP) started providing lectures and communicating with students via social media platforms, including zoom and WhatsApp.

Objectives: This research aimed to assess the opinions and level of satisfaction experienced by WAPCP students in Nigeria using social media platforms for lectures and communication in the College.

Methods: The research was conducted using a pre-tested, structured questionnaire administered to WAPCP students currently enrolled in the College and residing in Nigeria. Descriptive and inferential statistics were carried out using Statistical Package for Social Sciences (SPSS) ver. 21.

Results: With a response rate of 56%, a total of 130 questionnaires for the students who satisfied the inclusion criteria were analyzed. Following analysis, results show that 23% experienced a high level of satisfaction, 64% experienced moderate satisfaction, and 13% experienced low-level satisfaction with using social media for learning activities. Furthermore, 39% of participants preferred the use of online platforms, while 41% preferred the traditional face-to-face classroom style. About 75% said they preferred the combination of social media platforms and face-to-face classes.

Conclusion: Most WAPCP Students in Nigeria were highly satisfied with using social media platforms for online classes to undertake learning activities. However, they prefer a combination of social media platforms for lectures and traditional face-to-face classrooms for hands-on training.

Keywords: Traditional face-to-face classroom, online class, social media platforms.

WA 006 V

Assessment of healthcare professionals' level of knowledge and practice of Covid-19 safety precautions at the University College Hospital, Nigeria

Peter Oladotun Oladimeji¹, Akinniyi Akinbiyi Aje²

¹Pharmacy Department, University College Hospital, Ibadan, Nigeria.

²Department of Clinical and Administrative Pharmacy, Faculty of Pharmacy, University of Ibadan, Nigeria.

Email: pharmdot4real@gmail.com

Background: There is need for healthcare professionals working in healthcare facilities to know and have the understandings of some basic safety precautions which they must practice to prevent spread of Covid-19 in their respective healthcare facilities.

Objectives: The study was set out to assess the healthcare professionals' level of knowledge and practice of Covid-19 safety precautions at the University College Hospital, Nigeria.

Methods: A descriptive cross-sectional survey was conducted among 1156 healthcare professionals working at the University College Hospital, Nigeria. Respondents were purposively selected and data collected using a self-administered pre-tested questionnaire and collated/analysed using Statistical Package for the Social Sciences version 25.0. Chi-square test of independence was used to investigate association between variables and a probability value of $p < 0.05$ was considered statistically significant.

Results: More than two-thirds 843 (72.9%) of the healthcare professionals had sufficient knowledge while less than half 570(49.3%) had high level of practice of COVID-19 safety precautions. Professions ($P < 0.000$) of the respondents were significantly associated with their level of knowledge and practice of Covid-19 safety precautions.

Conclusion: The study concluded that the healthcare professionals working at University College Hospital, Nigeria had a good knowledge about Covid-19 safety precautions but their level of practice of this safety precautions were slightly below average. This was due to lack of Personal Protective Equipment, current reduction in Covid-19 cases at the time of this study, workload, nature of the job, non-wearing of facemask, non-availability of cleaning and sanitizing materials and occasionally eludes the mind.

Keywords: Assessment, Knowledge, Practice, Covid-19.

WA 007 V

Assessment of drug revolving fund scheme on the availability of health commodities in secondary health facilities of Bauchi State

Maryam S. Shehu¹, Ibrahim I. Yahaya²

¹Bauchi State Health Contributory Management Agency

²Pharmacy Department, Abubakar Tafawa Balewa University Teaching Hospital Bauchi

Email: ansiddiqah@gmail.com

Background: The availability of essential drugs is one of the most visible symbols of quality services and WHO recommended at least 80% availability in public health facilities. Drug Revolving Fund (DRF) scheme ensures that qualitative, rational and cost-effective drugs are available at all times.

Objectives: The aim of the study was to assess the impact of DRF scheme on the availability of essential health commodities in secondary health facilities of Bauchi state.

Methods: It was a descriptive cross-sectional study conducted in all the 26 Secondary Health Facilities of Bauchi State using a self-administered questionnaire. Data was presented as frequency, percentage, mean and charts of the demographic data, general practice, knowledge of DRF and availability of Tracer commodities. Statistical analysis was conducted on the data using the IBM Statistical Package for the Social Sciences (SPSS) Windows version 20 and Microsoft Excel office 2021.

Results: The study showed an appreciable rise in investment (capitalization) from 2013 to 2022 across all the 26 facilities with a 12.6% profit, even though only 12 out of the 26 facilities actually had profit, the remaining 14 recorded loss over the nine (9) years period. Growth in monthly sales was evident and the impact of training was obvious. The study found an average of 87.7% availability of tracer commodities in the facilities, which was in line with the WHO recommendation. Tab ACT (artemether/lumefantrine) was found to be 100% available in all the facilities while Tab Sulphadoxine/Pyrimethamine (SP) was the least available (42.3%).

Conclusion: The study has shown an acceptable percentage of the availability of tracer commodities that are critical to effective preventive and curative care in the secondary health facilities and training Pharmacists in the operationalization of the DRF scheme has greatly impacted on the successes recorded in the facilities.

Keywords: DRF, Assessment, essential health commodities

WA 008 V

Impact of pharmacists' intervention on knowledge, attitude and practice of pharmacovigilance among health professionals in Secondary Health Facilities in Bauchi

Maryam S. Shehu¹, Ibrahim I. Yahaya²

¹Bauchi State Health Contributory Management Agency

²Pharmacy Department, Abubakar Tafawa Balewa University Teaching Hospital Bauchi

Email: ibropharm@gmail.com

Background: Pharmacovigilance is essential to detect and prevent adverse drug reactions during post-marketing surveillance. However, adverse drug reactions are significantly underreported worldwide. Optimizing knowledge, attitude and practice has been shown to be important in encouraging ADR reporting.

Objective: The aim of the study was to evaluate the impact of Pharmacist's intervention designed to improve health care professionals reporting of adverse drug reactions in some secondary health facilities in Bauchi State.

Methods: Pre-post interventional study using a semi-structured questionnaire regarding the knowledge, attitude and practice of pharmacovigilance before and after series of educational intervention. Data was analyzed descriptively and inferentially.

Results: A total 202 health care professionals completed the

study (97 controls and 105 interventions). The mean knowledge score of the intervention group was 65% (Fair) which was increased to 91.25% (Good) after the intervention, while the control group had 63%, which was slightly increased to 64.75%. The mean practice level of the intervention and control groups were 6.7% and 6.2%, which were increased to 31.8% and 12.6% respectively at the end. However, there was no observable difference in the attitudinal responses between the control and intervention groups. A total of eight adverse drug reaction reports were obtained during the study period (6 from intervention and 2 from the control sites).

Conclusion: The Pharmacist's intervention positively impacted on the knowledge and practice of pharmacovigilance in Bauchi state with an indifferent change in attitude. Continuous medical education may be required to effect long-lasting changes in the attitude.

Keywords: Pharmacovigilance, Adverse Drug Reactions, Knowledge, Attitude and Practice

WA 009 V

Factors affecting Lifestyle Modifications among African Adult Patients with Type 2 Diabetes: a mixed method study

Onwuchuluba E. E, Soremekun R. O, Olugbake O. O.

Department of Clinical Pharmacy & Biopharmacy, Faculty of Pharmacy, University of Lagos, PMB 2033, Lagos

Email: eonwuchuluba@unilag.edu.ng

Background: Understanding factors affecting lifestyle modifications in Type 2 Diabetes management would assist in interventions to improve adherence.

Objectives: This study assessed the levels of adherence to diet and exercise and explored the associated barriers and facilitators.

Methods: This was an explanatory sequential mixed-method study that comprised a survey of a convenient sample of 418 Type 2 Diabetes patients and in-depth interviews with 25 purposively selected patients based on data saturation. The interviews were recorded and transcribed verbatim. The survey data were analyzed with SPSS version 23, while thematic analysis and NVIVO software were used.

Results: Of the 418 patients, over 58.8 % were females, aged 58.3 ±11.9 years. Most respondents were non-adherent to exercise (60.8%) and diet (79.9%). About 57.9 % had no meal plan, with majority (80%) consuming wrong food choices (high

in fat) and in excess quantity. Lack of understanding in choosing meals (58.6%), income ($p = 0.007$), and diabetes duration ($p = 0.046$) affected diet, while lack of knowledge on the importance of exercise (49.3 %) and age ($p = 0.028$) affected exercise. Further exploration revealed complaints about lack of autonomy in meal choices, dislike of the recommended food, and contradicting diet advice, while lack of good road and exercise facilities discourage exercise. Spousal support, perceived need to feel well and avoid complications facilitated lifestyle modifications.

Conclusion: Adherence to exercise and diet was generally poor with economic, personal, interpersonal, and sociocultural barriers affecting adherence. Spousal participation in diabetes management, and interventions targeted at multilevel barriers are essential.

Keywords: Adherence, Type 2 Diabetes, Lifestyle modification, Exercise, Diet, Barriers and Facilitators

WA 010 V

Satisfaction of physicians and pharmacists with the clinical reference materials for medication in a Nigerian teaching hospital

Nneoma Okpalanma, David Okechukwu, Brian Ogbonna

Department of Clinical Pharmacy and Pharmacy, Management, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra, Nigeria

Email: nneomaokoli@yahoo.co.uk, nn.okpalanma@coou.edu.ng

Background: Healthcare professionals need to have timely access to accurate resources in order to adequately care for their patients.

Objective: This study aimed to evaluate physicians' and pharmacists' satisfaction with the clinical reference materials and system for medication in a Nigeria Teaching Hospital.

Methods: A cross-sectional descriptive study was conducted on 90 physicians and pharmacists at Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Awka using a 15-item semi-structured questionnaire. Convenience sampling technique was used and data collected was analyzed using SPSS Version 23. Descriptive statistics: frequency distribution table (%) was used to summarize data collected. Spearman's correlation was used to determine the relationship between availability of reference materials and the satisfaction of respondents. The predictors of satisfaction with clinical reference materials were determined using logistic regression.

$P < 0.05$ was considered significant. Period of data collection was from January to March 2022.

Results: Forty-nine (54.4 %) males and forty-one (45.6 %) females participated in this study, out of which nineteen (21.1 %) were pharmacists and seventy-one (78.9 %) were physicians. Textbooks were the most frequently used clinical reference material (21.1 %), while textbooks and journals were the most available clinical reference material (12.2%). Lack of updated textbooks was identified as the major barrier (34.1 %) to the use of clinical reference materials.

Conclusion: The Physicians and Pharmacists in COOUTH showed dissatisfaction with the clinical reference materials for medications in the facility. Policy makers should intensify efforts to ensure the provision of adequate clinical reference materials in the health facility.

Keywords: Satisfaction, Pharmacists, Physicians, Clinical reference materials, medication, Teaching hospital

WA 011 V

Illness perception, knowledge, and self-care practices among patients with Type-2 Diabetes in public hospital: case study at Komfo Anokye teaching hospital, Kumasi Perpetua Kessie-Mensah

Komfo Anokye Teaching Hospital, Kumasi, Ghana.
Email: perpgie10679@gmail.com

Background: Self-care behaviors among people with type-2 diabetes are extremely important for managing the disease since inadequate self-care leads to complications. However, the Ghanaian setting has received relatively little research.

Objectives: This study aimed to assess level of knowledge of patient with type-2 diabetes, relationship between self-care practices and illness perception and the predictive effect of illness perception and the diabetes knowledge on patient's overall self-care.

Methods: A cross-sectional survey design was employed and a total of 200 participants were sampled from the Diabetic clinic at Komfo Anokye Teaching Hospital (KATH). A self-administered questionnaire was used as data collection tool. Convenient sampling technique was used to collect data.

Results: Results showed patients with T2DM had moderate (58.0%) level of knowledge of their condition. Again, the

pearson's correlation coefficient showed a significant positive relationship between diabetes self-care practices and the various domains and a negative relationship ($r=-0.043$, $p<0.05$) between illness perception and self-care practices. Furthermore, illness perception and diabetes knowledge significantly predicted self-care practices ($R^2=0.038$, $p=0.024$) i.e. illness perception and Diabetes knowledge jointly explained 4% of the variance in self-care practices of T2DM.

Conclusion: The way that patients perceive their disease condition and their understanding of diabetes play a major role in how they treat their condition. Therefore, it's critical that the right psychosocial interventions are created to support patients in adhering to advised self-care procedures.

Keywords: Type-2 Diabetes, self-care practices, illness perception, Diabetes Knowledge

WA 012 V

Utilization of opioids and patient care practices among cancer patients in a tertiary hospital in Nigeria Nneoma Okpalanma, Success Ifurueze, Brian Ogbonna

Department of Clinical Pharmacy and Pharmacy Management, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra, Nigeria
Email: nneomaokoli@yahoo.co.uk, nn.okpalanma@coou.edu.ng

Background: The safe and effective use of opioids in oncology setting is essential to the adequate provision of pain relief.

Aim and objective: This study aimed to evaluate opioid utilization and patient care practices among cancer patients in a Nigerian Teaching Hospital from January to December 2021.

Methods: The study was a retrospective cross-sectional study conducted on 100 prescriptions and 30 randomly selected patients. Systematic sampling technique was used to select prescriptions. Ethical approval was obtained for the study, while data was collected using a structured proforma. Utilization of opioids was evaluated using WHO Core drug prescribing indicators. Data was analyzed using SPSS version 28, and data summarized using descriptive statistics (frequency, percentages). Impact of demographics on utilization of opioids was assessed using Chi-square. Result was significant at $p<0.05$.

Results: The average number of drugs per prescription was 1.43. Percentage of encounter with opioids prescribed was 80 %, percentage of drugs prescribed by generic name was 100 %. For the patient care indicators, the average consulting time with physicians was 50 minutes, average dispensing time was 80 minutes, the percentage of drugs dispensed to patients was 90 %, percentage of drugs labeled was 95 %. Tramadol was the only opioid prescribed in the hospital. Patient demographics had no impact on the utilization of opioids for pain management.

Conclusion: This study revealed generic prescription and high use of opioids in the hospital. The government and hospital management should make adequate provision for other opioids for adequate pain management in cancer patients.

Keywords: Cancer patients, Opioids, Patient care, Tertiary hospital, Utilization

WA 013 V

Substance abuse among in-school adolescents in selected Local Government Areas of Osun State in Nigeria

Margaret O. Afolabi, Abisola E. Ayilara and Omoniyi J. Ola-Olorun

Department of Clinical Pharmacy & Pharmacy Administration, Faculty of Pharmacy,
Obafemi Awolowo University, Ile - Ife, Nigeria
Email: bunmafol@oauife.edu.ng; bunmafol@gmail .com

Background: Substance abuse is gradually reaching an alarming proportion among adolescents of school age, and this makes it imperative to examine the relevant factors with a view to stemming this dangerous trend.

Objectives: Objectives of this study were to identify various psychoactive drugs being used, prevalence and factors that influence substance use by in-school adolescents.

Methods: The study was conducted in four local government areas of Osun State, Southwestern Nigeria, with a total of 800 senior secondary school students as respondents. Relevant data were obtained using a modified version of a questionnaire designed by the United Nations for conducting school surveys on drug abuse.

Results: Students most widely used caffeinated products

(55.5%), alcohol (15.7%), cigarettes (17.6%), cocaine (5.7%) and marijuana (1.1%) as psychoactive substances. Other drugs indicated include sedatives (4.3%). They were obtained majorly from open drug market (23.5%) and peers (5.2%). Reasons for their use ranged from euphoric effect (21.8%) to psychosocial perceptions of self - need (22.2%). Most commonly used by oral route (90.1%) with less incidents of injections (4.7%).

Conclusion: The research concludes that there was a high frequency of psychotropic drug use among the respondent students with caffeinated products being the most widely used.

Key Words: Substance abuse, psychoactive drugs, adolescents, drug use

WA 014 V

Development of herbal reconstitutable dry suspension powders using formulated *Grewia mollis* mucilage polymeric reconstitution medium

Modupe O. Ologunagba¹, Tosin O. Alade^{1,2}, Chukwuemeka P. Azubuike¹, Boladale O. Silva¹

¹Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, University of Lagos.

²055 Nigerian Airforce, Force Camp Medical Centre, Victoria Island, Lagos.

Email: oologunagba@unilag.edu.ng

Background: The abundance and biodiversity of flora in West African sub-region can be explored for the development of herbal formulations. Plants such as *Andrographis paniculata* (Acanthaceae), *Acalypha fimbriata* (Euphorbiaceae), *Ficus sur* (Moraceae) and *Heliotropium indicum* (Boraginaceae) have been indicated with different folkloric usefulness for human health. These, singly or combined can be developed into simple cost-effective, patient friendly formulations such as reconstitutable dry suspension powders. *Grewia mollis* mucilage (Tiliaceae) can be investigated for the development of a polymeric reconstitution /suspending medium.

Objectives: To develop herbal dry suspension powders for reconstitution with formulated *Grewia mollis* mucilage based polymeric reconstitution medium.

Methods: The sourced plants *Andrographis paniculata* (AP), *Acalypha fimbriata* (AF), *Ficus sur* (FS) and *Heliotropium indicum* (HI) leaves and stem of *Grewia mollis* (GM) were authenticated and subjected to pre-formulation protocols (drying, trituration, packaging, organoleptic, physicochemical and solid state) using standard methods. The *Grewia mollis* mucilage (GMM) based reconstitution medium was developed using tragacanth mucilage (TGM) as a comparative control. The reconstituted suspensions were evaluated for pH, particle size,

sedimentation volume and re-dispersibility using established methods.

Results: The organoleptic properties of the powdered plant herbs (single or mixed components) were characteristic. The particle sizes ranged from 44.44 ± 1.27 to $139.38 \pm 6.20 \mu\text{m}$, the pH values range was (7.6 -7.9), all demonstrated fair flow properties. Purity of all herbs, GMM as well as compatibility were established by Fourier Transform Infra- Red Spectroscopy (FTIR) absorption peaks. An optimized GMM based reconstitution medium (pH 7.2-7.4) which had better reconstitution and re-dispersibility profiles comparative to TGM (pH 7.8-8.3) was successfully developed. The GMM reconstituted herbal suspensions also had better flow rate (0.12-0.14 mL/s) comparative to TGM formulation (0.09-0.18 mL/s).

Conclusion: Herbal dry suspension powders with acceptable properties before and after reconstitution as suspensions and a new reconstitution medium containing *Grewia mollis* mucilage polymeric base have been successfully developed.

Keywords: Plant herbs, Dry Suspension Powders, Reconstitution Medium, Polymeric base, *Grewia mollis* mucilage

Gas chromatography-mass spectrometry analysis of aqueous stem extract of *Croton membranaceus*Daniel Kwame Afriyie^{1,2}, Elvis Ofori-Ameyaw³, George Asare⁴, Ebenezer Ofori-Atta⁵, Regina Appiah-Opong⁵¹Department of Biomedical Sciences, University of Cape Coast, Ghana²West African Postgraduate of Pharmacists, Ghana Chapter³School of Pharmacy and Pharmaceutical Sciences, University of Cape Coast, Ghana⁴Department of Medical Laboratory Sciences University of Ghana⁵Department of Clinical Pathology, Noguchi Memorial Institute for Medical Research, College of Health Sciences, University of Ghana

Email: dspdan77@yahoo.com

Background: Aqueous root extract of *Croton membranaceus* has been used in the management of benign prostatic hyperplasia and prostate cancers (anecdotally claimed) over decades in Ghana. Gas Chromatography-Mass Spectrometry (GC-MS) analysis is a useful analytical technique in the identification, quality control and standardization of phytotherapeutics. Recent reports suggest the inclusion of the stem extracts in management of prostate disease conditions, without any evidence-based data.

Objective: This study was aimed at identifying phytochemicals in *C. membranaceus* aqueous stem extract with potential anti-benign prostatic hyperplasia and prostate cancer potentials using GC-MS analysis.

Methods: Lyophilized aqueous extract obtained directly from the pulverized stem of *C. membranaceus* was used for microwave assisted dichloromethane-methanol extract. The microwaved assisted extract was reconstituted in Methanol-Dichloromethane (1:1) and loaded onto GC-MS compatible vials and analysed using Perkin Emler Gas Chromatography (Clarus 580) equipped

with MSD mass spectrometer (Clarus SQ8S) instrument.

Results: Analysis of chromatograph obtained for the microwave assisted dichloromethane-methanol extract revealed the presence of 15 main phytochemical constituents. The major ten identified phytochemicals ranging from 3.00 to 32.58 % content were; 2,3- Butanediol, 2-butoxy-ethanol, 4-bromo-3,3,4,4-tetrafluoro-2-butanol, 2-(2-butoxyethoxy)-ethanol, Bacchotricuneatin c, N-(1-[1-(4-Amino-furazan-3-yl)-1H], 1-[1-(4-hydroxy-1-methylproline, n-hexadecanoic acid, 6-octadecanoic acid. And 7(1-[1-(4-hydroxy-1-methylproline composition was highest (32.58%).

Conclusion: Of the 15 constituents, 1-[1-(4-hydroxy-1-methylproline, n-hexadecanoic acid, and 6-octadecanoic acid are known for their anti-androgenic, hypocholesterolemic, antioxidant, 5-alpha reductase inhibitory, antifungal, antibacterial, antiviral or anticancer properties which could be responsible for the activity in prostate disease management.

Key words: *C. membranaceus* aqueous, stem extract, GC-MS analysis, anti-prostatic potentials