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A Survey On Doctors' Perceptions On The Efficacy Of Loop Diuretics Particularly (Furosemide And Torsemide) In Heart Failure Patients In Nigeria

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Abstract
Background *Managing heart failure, globally necessitates effective strategies. Loop diuretics like furosemide and torsemide are commonly prescribed for fluid control in heart failure patients. Despite the wide usage of these drugs, understanding the perspectives and practices of Nigerian doctors regarding these loop diuretics in heart failure management is crucial. This study aims to investigate Nigerian medical practitioners' perception on loop diuretic usage in heart failure treatment.*
Methods *A survey-based cross-sectional study design was used, targeting 100 doctors in the different healthcare settings in Nigeria. Participants were surveyed for data collection on demographic characteristics, knowledge, prescribing practices, efficacy perceptions, communication skills, and patient monitoring. Data analysis was descriptive statistics to investigate patterns and insights.*
Results *The survey achieved a 66% response rate signifying a high level of engagement by the medical community. The physicians differed in their preferences for loop diuretics, the majority of them preferred furosemide. Influencing factors of prescription choice included efficacy, safety profile, cost, and patient preferences. Efficacy perceptions and the knowledge of current guidelines was positive. However, limitations and side effects were noted as well. Benefits and risks were mainly communicated to patients orally and regular patient monitoring was reported.*
Conclusion *This study illustrates the complexities of loop diuretic use in heart failure management in Nigeria and shows why such interventions should be tailored to meet the identified challenges and improve clinical care. Knowledge of preferences, perceptions and practices of doctors can guide targeted interventions aimed at optimizing heart failure treatment strategies and improving patient outcomes.*
Keywords: *Drug Efficacy, Loop Diuretics, Furosemide, Torsemide, Heart Failure*

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I. Introduction

In nearly all regions of the world,Heart Failure (HF) is both common and increasing.(1,2)Although death rates from cardiovascular disease (CVD) as a whole have declined, HF is the only major CVD whose prevalence and incidence are thought to be increasing (3) and the long-term prognosis associated with HF is poor.(4)

Past community-based investigations onHF occurrence have most often been performed in the high-income world. However, prevalence is projected to rise in lowand middle-income countries (LMICs) as populations, age and the burden of HF risk factors such as elevated blood pressure increases in the coming decades.(5)HF is also likely to confer significant economic burden to individuals and health systems.(5)

In Africa, HF is a frequent and severe condition, yet few data are available that takes into account modern advances.(3)HF affects over 64.3 million people worldwide.(6)It is a highly symptomatic syndrome that affects 1-3% of the population in high income countries especially in people above the age of 65 years.(7,8)

Recent data from sub-Saharan Africa on acute HF shows that the leading causes of HF are hypertension, rheumatic heart disease, cardiomyopathies and ischemic heart disease. It affects mainly those of

middle age (in the prime of their life). Mortality at 6-months is about 17.8%(9) and twice this rate at 12 months. (10,11) In Nigeria, HF has a mortality rate of 12.5% yearly.(12)

Congestive Heart Failure(CHF) is associated with morbidity and mortality. Using diuretics for relief is a mainstay of treatment in veterinary and human patients. Diuretics increases urine production, causing water,sodium (Na) loss and resolution of congestion. (13,14)

Loop diuretics, such as furosemide and torsemide are recommended for relieving symptoms and signs of congestion in patients with chronic heart failure and are administered to more than 80% of them. However, several of their effects have not systematically been studied.(15)Although furosemide is the most commonly used loop diuretic in patients with heart failure, some studies suggest a potential benefit for torsemide.(16) Several small studies of torsemide vs. furosemide(17) and a recent meta-analysis(18) suggested a decrease in HF morbidity and potentially mortality with torsemide compared with furosemide. These previous studies were limited by modest sample sizes in cohorts of patients from more than a decade ago. Newer studies state that in order to investigate the potential role of torsemide in contemporary clinical practice,loop diuretics should be assessed in large, international acute HF trial and evaluate the association with baseline characteristics and post-discharge outcomes.(19)

On the other hand, with regard to medical professionals' especially doctors,preferences and perceptions of these two medications in terms of relative efficacy varies.There is information regarding this being a gap since little data has been found focusing on doctors indeed.In order to improve the culture of standard health care for HF sufferers in Nigeria and indeed, globally, it is important that the physician's views on loop diuretics are acknowledged. It also needs an advocacy system putting into consideration a patient-centered approach. To maximize therapy results and reduce problems, it is essential to comprehend these elements. By investigating clinicians' opinions on the overall satisfaction, and clinical efficacy of furosemide and torsemide in the treatment of heart failure in Nigeria, the study seeks to close a gap in the body of current information. The main objective of this study is to determine the opinion, attitude and experience of Nigerian physicians regarding the use of torsemide or furosemide in management of heart failure cases.

II. Methods

A cross-sectional survey approach to gather information on doctors' views regarding the use offurosemide or torsemide as treatment of heart failure patients was employed. Samples of physicians from both public hospitals, private clinics and teaching institutions with experience in the use of loop diuretics to cover the whole Nigeria was collected. During the survey, to make sure that proportions from different settings are captured, random sampling was employed. Informed consent was obtained from each physician involved in the study.

An open-ended type questionnaire specifically designed for quantitative and qualitative data with questions pertaining to demographic information, knowledge and prescribing practices, perception of efficacy, communication and patient monitoring was used. These physicians' perceptions were collected with respect to the effectiveness and reason for choice of loop diuretics.The participants were acquired from professional networks and medical associations through the use of an electronic survey form.

The study targeted 100 medical personnels perceptions to the use of loop diuretics, namely doctors with experience in prescribing loop diuretics. Data was collected using a questionnaire developed primarily with the help of Google Forms. It comprised portions regarding population data, information on the loop diuretics awareness and familiarity, effectiveness perceptions views, and decision-making rationales. To establish the validity of clarity, relevance and reliability among them, a pilot test was done by administering questionnaires to practicing healthcare personnel before larger scale implementation. The completed questionnaire along with a cover letter, which described the aim of the study as well assuring voluntary nature and anonymity was sent to participants via direct message through professional networks. SPSS was used to statistically analyze quantitative data derived from the survey including descriptive statistics such as means and frequencies in order to identify relationships among variables.

Ethical principles were observed in the study as participants gave their informed consent, and confidentiality was maintained together with data security measures. This broad approach was designed to document the doctors' views on loop diuretics and provide an invaluable analysis of their clinical practices.

III. Results

The survey focused on 100 doctors in Nigeria to understand their opinions on loop diuretics use (furosemide or torsemide) among heart failure patients and received a 66% response rate. Demographic features among the respondents were heterogeneous as various years of experience and medical specialty was noted. Their perceptions demonstrated the main use of furosemide versus torsemide in terms of percentage. 56.1% had 0-5 years of experience, 6-10 years of experience were 25.8% and 18.2% of physicians are greater than 10 years. Of the 66 respondents, 27.3% were internal medicine physicians, 22.7% were cardiologists, 19.1% were general

practitioners, 4.5% family medicines, 3% nephrologists and other departments included were noted. The geographic location in Nigeria of each doctor was duly represented. 74.2% of the physicians were familiar with the use of loop diuretics.

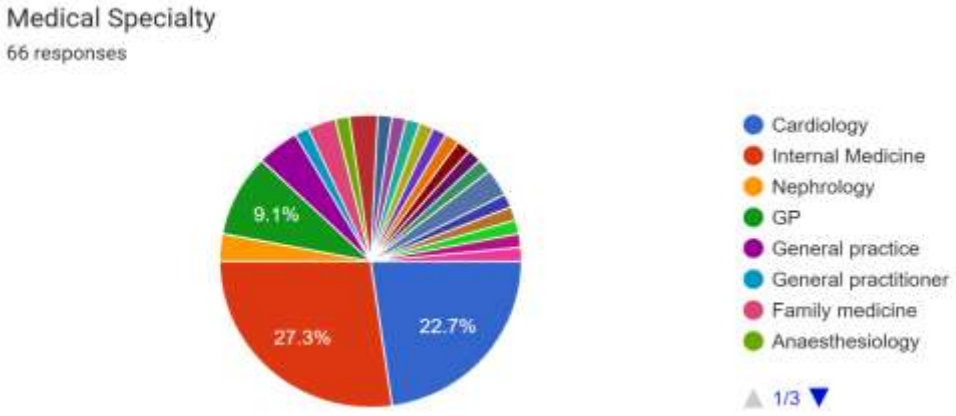

Figure 1:Medical Specialty Of The Physicians.

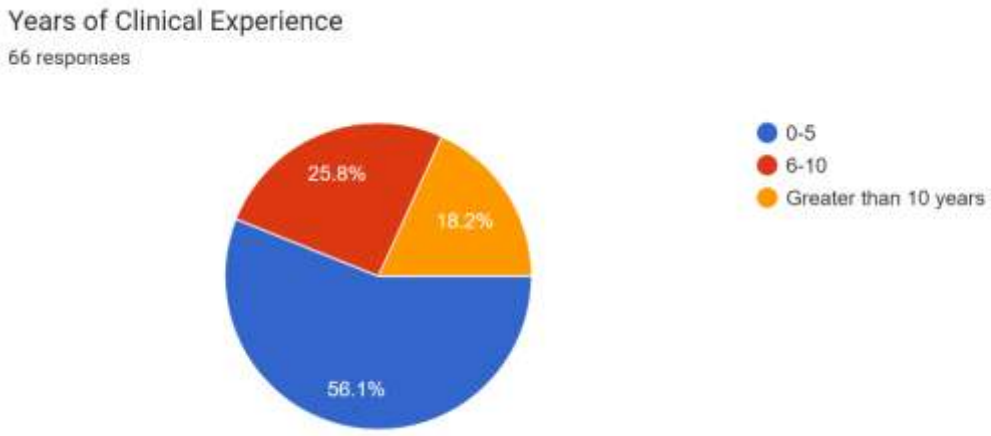

Figure 3: Duration Of Clinical Experience.

KNOWLEDGE AND PRESCRIBING PRACTICES

Almost all doctors claimed to be familiar with loop diuretics. 74.2% doctors use loop diuretics in heart failure patients. 63.9% doctors prescribed loop diuretics in adherence to current guidelines such as European Society of Cardiology (ESC) and European Society of Hypertension (ESH) guidelines. 57.6% preferred furosemide and 42.4% preferred torsemide in CHF. 15.2% difference in the Doctors preference of the different diuretics. The various factors that influence their choice of loop diuretics in heart failure includes 84.8% Efficacy, 60.6% safety profile, 50% cost and 15.1% patient preferences.

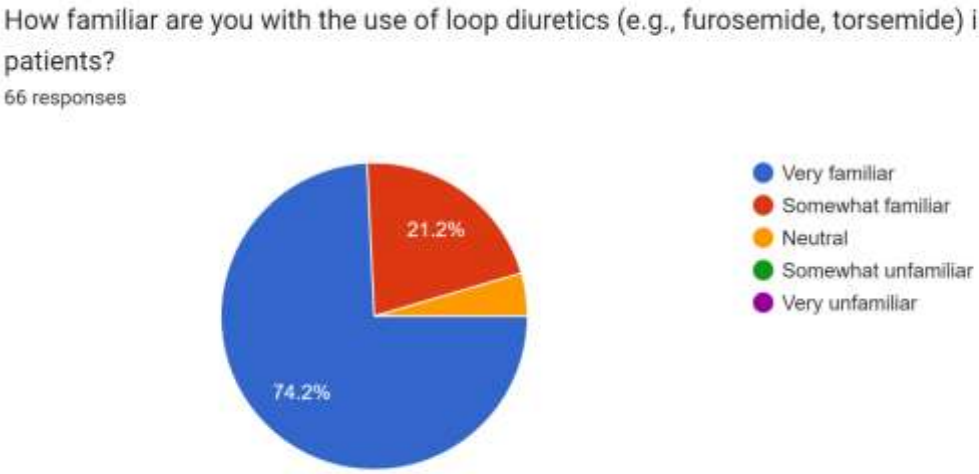

FIGURE 4: Familiarity of the Physicians in The Use of Loop Diuretics.

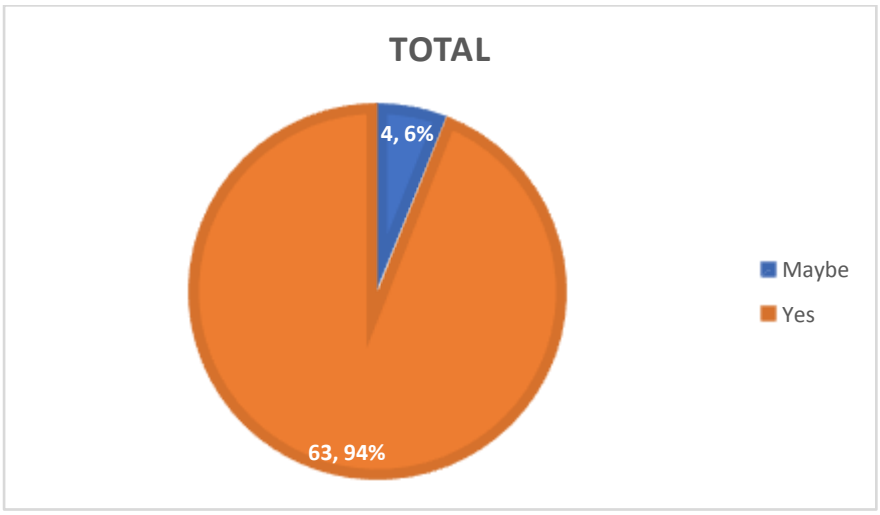

Figure 5: Use of Current Guidelines in prescribing loop diuretics.

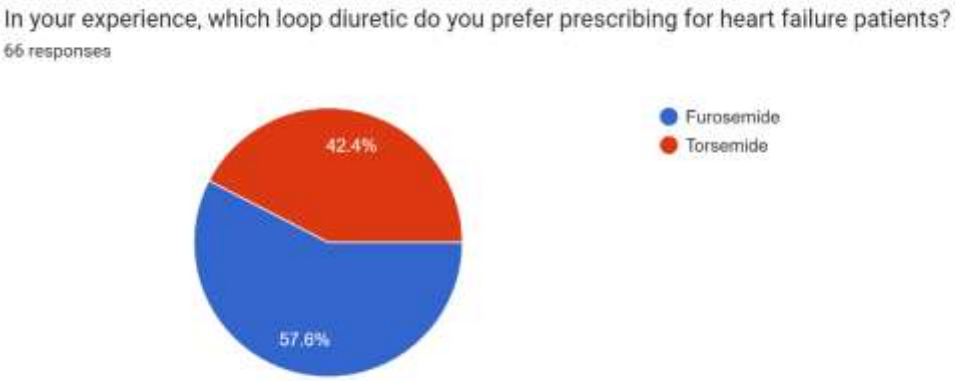

Figure 5: Doctors Preference of Loop Diuretics (Furosemide Vs Torsemide)

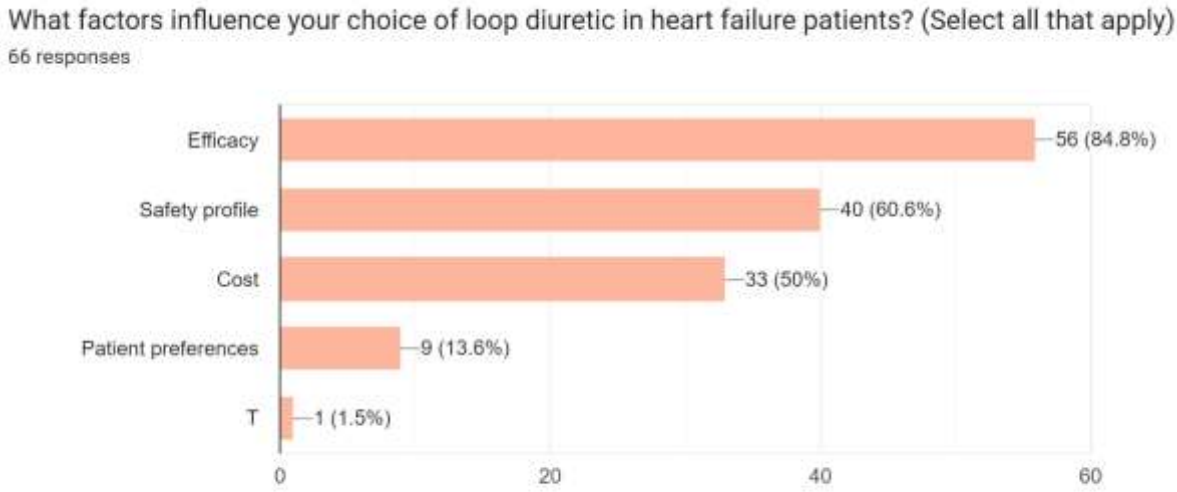

Figure 6: Factors Influencing Their Choices

PERCEPTIONS OF EFFICACY

The overall efficacy of loop diuretics in managing fluid retention in heart failure patients was rated with over 31.8% doctors stating extreme efficacy. Most doctors agree to the use of furosemide and torsemide improving symptoms and quality of lie in patients (93.9%). Most doctors experienced electrolyte derangement(hyponatremia and hypokalemia), hypotension, frequent urination and dehydration as limitation to use

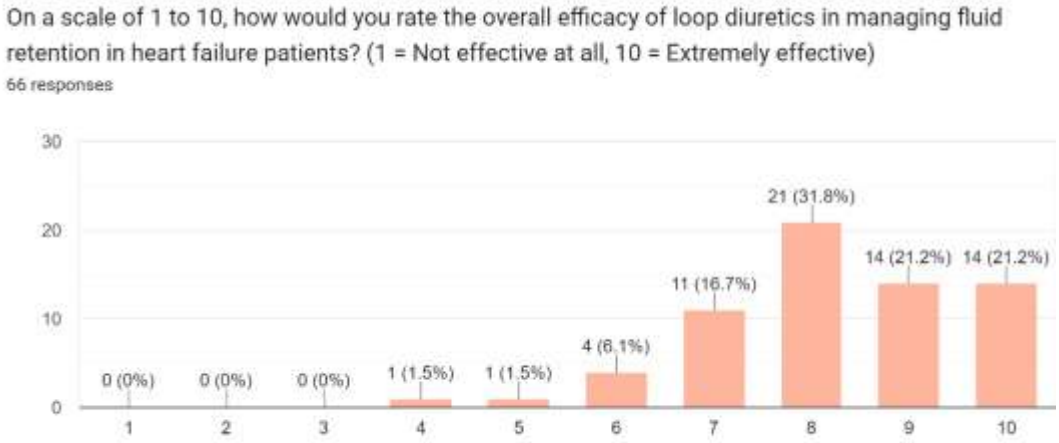

FIGURE 7: Overall efficacy of diuretics in fluid management.

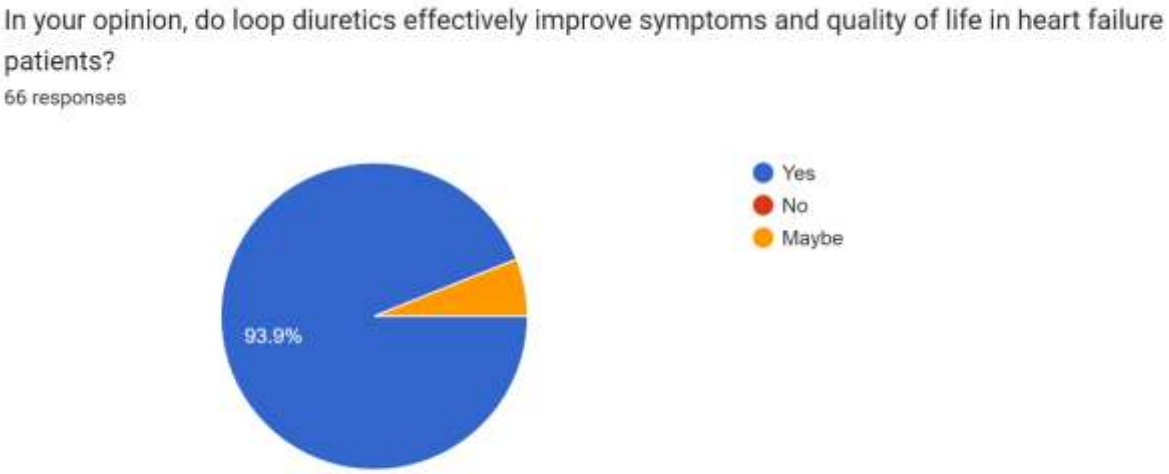

Figure 8: Efficacy of Loop Diuretics in Heart Failure**.**

COMMUNICATION AND PATIENT MONITORING

Most doctors communicate the benefits and potential side effects of loop diuretics to the patients through verbal communication (63.6%) and both verbal and written communication (31.8%). patient monitoring by the doctors was done regularly at every visit (66.7%) and 22.7% as needed based on the symptoms of the heart failure patient at the time of visit or hospitalization. 7.6% of doctors monitored their patients periodically, every few months.

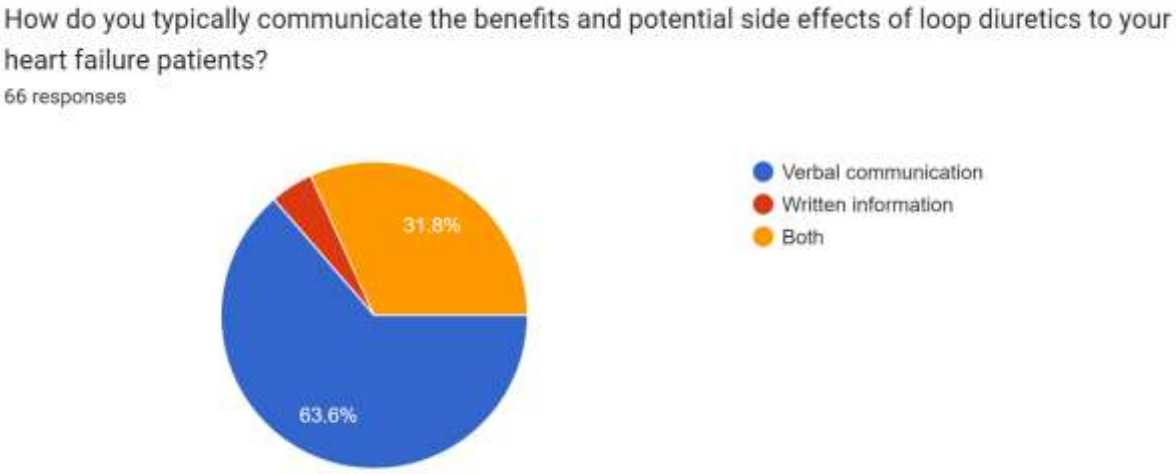

Figure 9: Communication Patterns of Doctors Using Loop Diuretics

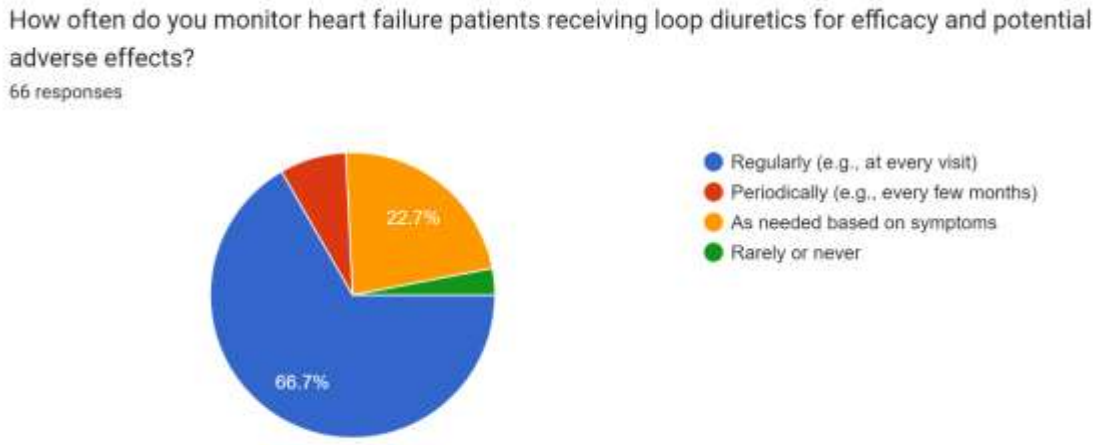

Figure 10: Frequency of Follow-Up by the Doctor.

IV. Discussion

Doctors' perceptions on the efficacy of loop diuretics (furosemide and torsemide) in heart failure patients showed a 66% participation rate which is considered an appropriate rate of engagement among the medical community considering the nature of these schedule of the profession. Notably, more useful data could be deduced from a larger sample size but considerations were made about the unavailability of the doctors due to the nature of the clinical practice. The respondents' demographic characteristics were heterogeneous, containing different years of experience and represented by different medical specialties, leading to diversified perspective on the theme.

With more general practitioners than specialist respondents. There is a justifiable shift in the perception rate for use of prospective and current guidelines. A considerable number of doctors (74.2%) claimed to be familiar with loop diuretics use in the treatment of heart failure. 63.9.% also affirmed to the knowledge of ESH/ESC guidelines of prescribing loop diuretics in heart failure patients to reduce hospitalizations.(20) The current (ESC) guidelines recommend the use of three loop diuretics (furosemide, torsemide, bumetanide) in order to not only reduce HF hospitalizations but also improve symptoms and exercise capacity in patients with signs and/or symptoms of congestion. In addition, for the first time in hypertensive patients, (ESH) guidelines recommend the use of torsemide. (20) The numbers included 57.6% that opted for furosemide, and 42.4% that favored the torsemide research basis of a 2016 study. (19)

Among the reasons for their choice of loop diuretics were efficacy (84.8%), safety profile (60.6%), cost (50%) and patients' preferences (15.1%).
There is no doubt that Torsemide has a better pharmacokinetic and pharmacodynamic profile than furosemide, with greater bioavailability, a longer half-life, and higher potency.(19,20) this is in agreement with the current guidelines above. Generally, doctors in Nigeria deemed loop diuretics effective in the management of edema and congestion among heart failure patients, with 31.8% giving an extreme account. A majority of doctors reported improvement of symptoms and quality of life upon administration of either furosemide and torsemide. 93.9% with more specialists preferring torsemide to furosemide leading to the almost insignificant difference.

Therefore, the reasons to these choices could be availability of furosemide to torsemide, marketing prowess of the many pharmaceutical dosage-based companies who produce more furosemide than torsemide and the cost which is arguable because to achieve the advantage torsemide offers a double of the dose of furosemide is prescribed.

Moreover, the use of these drugs was limited by side effects, such as electrolyte imbalances (hyponatremia and hypokalemia), hypotension, frequent urination, and dehydration.
Most doctors communicated the side effects of loop diuretics to the patients through verbal communication (63.6%) and a mixture of verbal and written communication (31.8%). The patients were monitored by doctors

on a regular basis through every visit (66.7%) and when symptoms occurred (22.7 %) while a marginal percentage of patients were monitored periodically every few months (7.6%) this indicating the good follow up practice of the doctors.

The popularity of furosemide over torsemide raises the question of what other factors have led to this choice, including efficacy, safety, adverse effects, cost and so on. Based on cost, due to higher availability of different brands of furosemide it is seen to be inexpensive compared to torsemide but this can be raised as an argument. Significant clinical effect is immediate with torsemide due to the prementioned pharmacological advantage(20) therefore most physicians suggest an increase in the dose of furosemide in the place of torsemide which would question inexpensive nature compared to torsemide. In addition, other physicians suggested the addition of medications such as metolazone in addition to furosemide in clinical use.

With all the above taken into consideration furosemide still tops torsemide with a difference in percentage of 5.2% and this can be attributed to the ease of access and availability of furosemide to torsemide which should be questioned. With the results and findings above, there is confirmation to backup recent claims of popular research study like TRANSFORM-HF(16,21,22) that among patients discharged after hospitalization for heart failure, torsemide compared with furosemide did not result in a significant difference in all-cause mortality. Therefore, supporting the percentage values derived from this research and choice of the majority of doctors. Particularly noting inclusion criteria of the trial to be discharged patients because the fast onset of action, reduced dose and increased bioavailability remain important in management of clinical emergencies in HF patients.

The reported efficacy of loop diuretics in symptom improvement further illustrates the importance of them in heart failure treatment. Based on clinical findings with major consideration in emergency cases of heart failure, the pharmacological advantages of torsemide significantly beneficial to the physician and the patient in question thereby improving the quality of life of these patients on admissions. However, after hospitalization the effects between the two molecules are arguably similar as seen in this report showing significantly less difference between the two loop diuretics and supported by other studies(16,21).

V. Conclusion

The survey of Nigerian doctors showed a wide range of opinions and preferences about the use of loop diuretics in the treatment of heart failure. Although, furosemide continues to be the most popular option in terms of cost, toxicity level, and effectiveness all play a role in prescription decisions. Even though side effects are perceived favorably, careful patient monitoring and education are still affected by the doctors in prescribing. These results highlight the necessity of customized interventions in Nigeria's healthcare system to improve patient outcomes and optimize treatment regimens for heart failure.

VI. Limitations of the study

Although adequate, the study's sample size might not accurately reflect the range of viewpoints held by physicians in Nigeria's various areas and healthcare environments. A bigger sample size might offer a more thorough knowledge of the nation's usage of loop diuretics. and the lack of patient viewpoints.

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