Priscription Pattern of Lipid Lowering Drugs among Diabetic and Hypertensive Patients in Five selected Public Health Facilities in Delta State

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ABSTRACT

This study determined the pattern and awareness of the use of lipid lowering drugs among diabetic and hypertensive patients in five selected Government Health Facilities in Delta State. It was a retrospective study of case notes of patients of hypertension-only, diabetes-only as well as diabetic hypertensive between November and April,2009 at Government General Hospital Abraka (GHA), Government General Hospital Obiaruku (GHO), Delta State University Health Centre Abraka (UHC), Eku Baptist Hospital (EBH),Central Hospital Warri(CHW). Information obtained from the case notes were recorded in a structured questionnaire which were then analyzed .The result showed that the assessment of lipid profile and routine prescription of lipid lowering drugs for these classes of patients in these health institutions were rare generally. The few cases who conducted these tests were recorded at the bigger urban health facilities (EBH and CHW).The study also suggest an indirect evidence of appreciably high level of awareness among health care givers, of the increased risk of atherosclerotic vascular disorders and their fatal complications in these patients, being indicated by the high rate of prescription of low dose aspirin (20.55%,13.2% and 14..2%) among hypertensive/diabetic, hypertensive- only and diabetic-only patients respectively as prophylactic measure.The study concludes that there is a need to educate health care givers especially in rural areas and smaller urban/ semi-urban health facilities on the importance of lipid profile assessment and the lifesaving potential of lipid lowering drugs such as the statins in patients that have increased risk of atherosclerotic vascular disorders

Key words: Prescription pattern, Lipid Lowering Drugs, Diabetics, Hypertensive, Selected HealthFacilities, Delta State**.**

INTRODUCTION

The different hospital management and head of medical records were informed about the purpose of the study and approval of the experimental protocol and co-operation were obtained from each center. Altogether, one hundred and thirty five (135) case notes of hypertensive only, diabeticsonly and hypertensive/diabetes patients seen at the outpatient departments of the health centers between November 2008 and April 2009 were included in the study.

Protocols consisting of open and closed – ended questionnaires were prepared. Information obtained from case notes were filled into each questionnaire. The questionnaire was organized in sections that obtained information from the case notes on; the locality of study, bio-data , morbidity status, laboratory investigations including lipid profile, clinical laboratory results, out-patient prescriptions, co-administered drugs for associated acute morbidities.The results were presented as frequency and percentage frequency distributions.

RESULTS AND DISCUSSION

A total of 135 patient case notes were assessed in all the different health institutions and of this population Abraka General Hospital (AGH), Obiaruku General Hospital (OGH), University Health Centre (UGH), Eku Baptist Hospital (EBH) and Central Hospital Warri represented 9%,13%,13%,35%and 30%respectively (Table 1).

Table 1: Distribution of sample population of patients in the different health institutions.

Gender	Number of patients in Health Institutions					
	AGH	OGH	UHC	EBH	CHW	Total(b)
Male	6	7	8	28	20	69
Female	6	11	10	19	20	66
Total(a)	12	18	18	47	40	135

Total(a) - column total   Total(b) - row total
AGH-Abraka Government General Hospital,OGH-Obiaruku Government General Hospital,UHC-Delta State University Health Centre,Abraka, EBH-Eku Baptist Hospital, CHW- Central Hospital Warri

Table 2: The age distribution of sample population studied in the different health institutions.

Age group	Number of patients in Health Institutions					
	AGH	OGH	UHC	EBH	CHW	Total(b)
0-20yr	1	3	3	nil	nil	7
21-40yr	3	4	6	4	6	23
41-60yr	3	3	7	22	18	53
0ver 60	5	8	nil	19	20	52
Total(a)	12	18	16	45	44	135

Total(a) – column total   Total(b)— row total
AGH-Abraka Government General Hospital,OGH-Obiaruku Government General Hospital,UHC-Delta State University Health Centre,Abraka, EBH-Eku Baptist Hospital, CHW- Central Hospital Warri.

Table 3: Laboratory Assessment of Lipid Profile (Frequency of Requests) in the Different Health Institutions

Lipid type assessed	Number of patients in Health Institutions				Total (b)
	EBH		CHW		
	Normal	Elevated	Normal	Elevated	
Total Cholesterol	2	Nil	5	2	9
Triglycerides	2	Nil	Nil	Nil	2
Total	4	Nil	5	2	11

Total(a) – column total   Total(b)— row total
EBH- Eku Baptist Hospital; CHW- Central Hospital Warri
Normal Serum Total Cholesterol < 200mg/dl
Elevated Serum Total Cholesterol 200-240mg/dl
Normal Serum Triglyceride < 120mg/dl

49% of the patients whose case notes were assessed were females while 51% were males (Table 1).Of the 135 patients whose case notes were assessed,5.2% were within the age range 0-20 yrs, 17% (21-42yrs), 39.3% (41-60yrs), 38.5% were over 60 yrs (Table 2). This observation is in keeping with previously reported and an expected higher prevalence of hypertension and diabetes among the middle age and elderly population[8-10].

The result also showed that most of the patients whose case notes were reviewed had been on treatment for less than three months at the time of the study. Eku Baptist Hospital is observed to have more hypertensive- only patients on treatment for over 6 months [13] while the university health centre had the highest number of patient on treatment for less than three months. There were also more diabetics on treatment for less than 3 months than for the other duration. Among the different health institutions more diabetic-only patients were encountered atObiaruku General Hospital.

Only 11 recorded results of lipid profile assessment was observed in all centers put together and of these the blood cholesterol level was only

Table 4: Anti-Hypertensive Drugs Prescribed for Patients in the Different Health Institutions

Drug	%Frequency
Diuretics	16.08
B-Adrenoceptor Blockers	7.84
Calcium Channel Blockers	29.41
ACEI	22.35
Other Vasodilators	10.2
Aldomet	14.12

B-Adrenoceptor Blockers- Propanolol,Atenolol, ACEI- Angiotensin Converting Enzyme Inhibitors, Other Vasodilators (Alpha$_2$ receptor selective blockers, Hydrallazine); Aldomet- Alpha Methyl-Dopa

Table 5: Anti- Diabetic Drugs prescribed for Patients in the different Health Institutions.

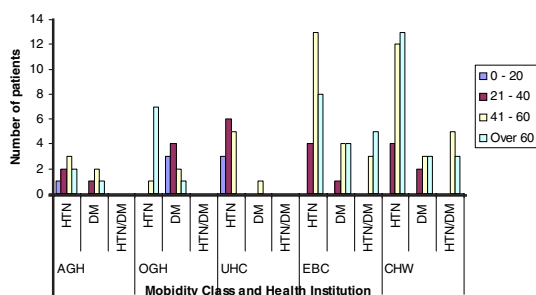| Drug Class	Frequency of Use
Insulin only	9
Sulfonylurea only	Nil
Biguanides only	3
Sulfonylurea + Biguanides	8
Insulin Start + Sulfonylurea	2
Insulin Start + Sulfonylurea + Biguanide	6
Insulin Start + Biguanides	3
Insulin and other oral hypoglycaemic	Nil
Not Specified	28

Fig. 1: The age distribution of the different morbidity classes among patients in the different health institutions
AGH-Abraka Government General Hospital,OGH-Obiaruku Government General Hospital, UHC-Delta State University Health Centre,Abraka, EBH-Eku Baptist Hospital, CHW- Central Hospital Warri. HTN-Hypertensives only, DM-Diabetic only,HTN/DM- Hypertensive and diabetic patients
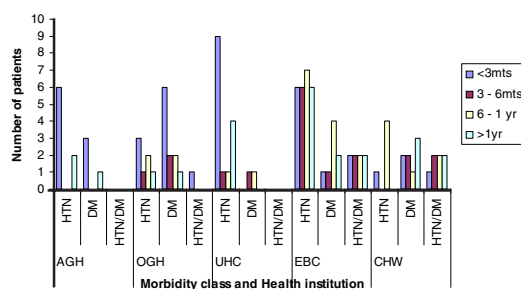

Fig. 2: Duration of treatment of patients of the different morbidity classes in the different health institutions
AGH-Abraka Government General Hospital,OGH-Obiaruku Government General Hospital,UHC-Delta State University Health Centre,Abraka, EBH-Eku Baptist Hospital, CHW- Central Hospital Warri. HTN-Hypertensives only, DM-Diabetic only, HTN/DM-Hypertensive and diabetic patients

Table 6: Co-administered Drugs in Hypertensive-only Patients in the Different Health Institutions

Drug Class	Number of patients in Health Institutions					
	AGH	OGH	UHC	EBH	CHW	Total(a)
Low Dose Aspirin	nil	1	4	18	21	44
Antimalarials	4	8	8	4	13	47
Antibiotics	5	6	1	12	12	36
Digitalis	nil	nil	nil	5	1	6
Anti-asthmatics	nil	nil	nil	4	2	6
Anti- Tuberculous	nil	nil	nil	2	4	6
Anti-Ulcer	2	nil	11	4	4	21
Anti-diarrhoeas	1	nil	nil	4	nil	5
Anti-emetics	nil	1	nil	3	2	6
NSAIDS	4	3	5	10	23	46
Vitamins	5	4	4	7	31	51
Lexotan	9	7	7	10	20	53
TCAs	nil	nil	nil	5	nil	5
Total (b)	30	30	40	83	133	316

Total(a) – column total   Total(b)— row total
AGH-Abraka Government General Hospital,OGH-Obiaruku Government General Hospital,UHC-Delta State University Health Centre,Abraka, EBH-Eku Baptist Hospital, CHW- Central Hospital Warri

elevated in 2 cases (between 200-240mg/dl) the rest patients had blood cholesterol level below 200mg/dl which is considered as normal for the technique used in the assessments. The blood triglyceride level was recorded for 2 of these patients and was essentially within the normal ranges (Table 3).

All the recorded assessments of the lipid profile in diabetic and hypertensive patients were observed at the urban health institutions, Central Hospital Warri (CHW) and Eku Baptist Hospital(EBH), suggesting that lipid profile assessment was more likely to be carried out in urban than in semi-urban and rural health centers. The observation of low level of screening and treating for dyslipidemia among these patient sets is not in line with best health care practice as asubstantial body of evidence support reducing modifiable risk factors of ASVD such as elevated blood pressure,dyslipidemia, smoking and diabetes mellitus reduce associated morbidity and mortality. Hence screening for and treating these conditions forms the basis of many published

guidelines of risk assessment and reduction strategies[11-12].

The result showed that the calcium channel blockers were the most frequently prescribed anti-hypertensive (29.41%) closely followed by the Angiotensin Converting Enzyme inhibitors and diuretics which represented 22.34% and 16.07% respectively. Beta-adrenoceptor blockers were the least prescribed group of anti-hypertensive (7.84%) in this study (Table 4).The observation of CCBs representing the most commonly prescribed antihypertensive medication is in line with published report from Taiwan[13] but contradicts recommendations based on clinical evidence and cost effectiveness made by international health bodies like United States Joint National Committee and United Kingdom National Institute for Health and Clinical Excellence (NICE) that diuretics particularly of the thiazide type should be the first choice antihypertensive drug class in patients with no compelling indications[14-15]. The result of this study also suggest increasing

Table 7: Co-administered Drugs Along with Anti-diabetic Agents among Diabetic-only patients in the Different Health Institutions.

Drug class	Number of Patients in Health Institutions					
	AGH	OGH	UHC	EBH	CHW	Total(b)
Low Dose Aspirin	Nil	1	1	6	7	15
Antibiotics	1	5	1	10	Nil	17
Antimalarial	1	2	1	2	2	8
Benzodiazepines	1	1	Nil	Nil	3	5
Anti Asthmatics	Nil	Nil	Nil	1	Nil	1
Anti Diarrhoea	Nil	2	1	5	1	9
Anti emetics	Nil	1	Nil	Nil	Nil	1
Anti-convulsants	Nil	Nil	Nil	Nil	1	1
NSAIDS	4	6	3	2	1	16
Vitamins	1	2	Nil	Nil	Nil	3
Anti-tussives	Nil	2	Nil	Nil	Nil	2
Anti helmintics	Nil	2	Nil	Nil	Nil	2
Anti-ulcer	2	nil	nil	2	Nil	4
Total(a)	10	24	7	28	15	84

Total(a) – column total   Total(b)— row total
AGH-Abraka Government General Hospital,OGH-Obiaruku Government General Hospital, UHC-Delta State University Health Centre,Abraka, EBH-Eku Baptist Hospital, CHW- Central Hospital Warri. NSAIDs- Non-Steroidal Anti-Inflammatory Drugs

prescription rate for angiotensin converting enzyme inhibitors which could be due to increasing awareness of their ability to delay progression of nephropathy in diabetic and hypertensive[16].

About 15% of the diabetic patients whose case notes were reviewed were being managed with insulin injections (Table 5). Of the sample population, 13.3% were receiving combination of Sulphonylureas,mainly Daonil and a Biguanide (Glucophage).

A total of 5% of the diabetic patients were initially started on insulin before they were maintained on either biguanide only or sulphonylureas only.

10% of the sampled population had initial therapy with insulin injection after which they were maintained on Sulphonylureas and Biguanide. While 47.6% of diabetic patients had no record of the drug treatment they were on for their diabetic condition. This could either be due to the fact that they are on diet control that is effective or they may

have resorted to other treatment modalities such as traditional and alternative medicines.

A total of 332 non-anti-hypertensive prescriptions were made in all the case notes of hypertensive-only patients and the most frequent prescriptions in this group were vitamins, anti-malarias, none steroidal anti- inflammatory drugs (NSAIDs), low dose aspirin and anti-biotics representing 15.4%, 14.2%, 13.9%, 13.3% and 10.8% respectively of the total (Table 6).

This prescription patterns strongly reflects the high prevalence of malaria and other infectious diseases in tropics as well as a high prevalence of osteo- and rheumatoid arthritis among people in the middle and elderly age groups who are more likely to be hypertensive and/ordiabetic. The trend also shows a high prescription rate of vitamins by medical practitioners.

The high rate of use of low dose aspirin among hypertensive patient suggest that there is high level of awareness amongst practitioners in

Table 8: Non Anti-diabetic and Non-hypertensive drugs Prescribed Among Diabetic / Hypertensive Patients in the Different Health Institutions

Drug classes	Number of Patients in Health Institutions		
	EBH	CHW	Total(b)
Low Dose Aspirin	9	6	15
Anti-biotics	5	1	6
Antimalarials	10	4	14
Digitalis	Nil	Nil	Nil
Anti-asthmatics	Nil	Nil	Nil
Anti-diarroea	5	Nil	5
Anti-helminths	1	1	2
Anti-emetics	1	Nil	1
Anticonvulsants	Nil	Nil	Nil
NSAIDS	8	2	10
Vitamins	4	6	10
Diazepam/Lexotan	4	4	8
TCAs	2	Nil	2
Total(a)	49	24	73

Total(a) – column total   Total(b)— row total
EBH-Eku Baptist Hospital, CHW- Central Hospital Warri. NSAIDs- Non Steroidal Anti-Inflammatory Drugs. TCAs – Tricyclic Antidepreesants

the different health institution of the higher risk of atherosclerotic vascular disorders and their complications in hypertensive patients[17]. However, according to a new study, low-dose aspirin as primary prevention did not appear to significantly reduce the risk of a combined end point of coronary, cerebrovascular and peripheral vascular events in patients with type 2 diabetes, even though it significantly reduced the combination of fatal coronary and fatal cerebrovascular events[18].

Low dose aspirin have been reported to prevent platelet aggregation and interfere with pathogenesis of thrombo-embolic disorders [16].

The most frequently co-administered non anti-diabetic drugs amongst diabetic-only patients in all the health institutions studied were vitamins, antibiotics, NSAIDs and low dose aspirin representing 21.9%, 16.19% ,15.2 and 14.2% respectively of total number(105) of such prescriptions (Table 7).

Although, there were fewer prescriptions of anti-diarrhea and anti-malaria drugs in this group of patients compared to the aforementioned classes. There were however, more frequently prescribed than the other classes of co-administered drugs.

Poor glycaemic control amongst diabetics is well recognized risk factor for increased susceptibility to infectious disease[19]. This could explain the relatively higher prescription rate of antibiotics and anti-diarrhea agents in this set of patients. Again the observation of a relatively high prescription rate of low dose aspirin in this group of patients also suggest that there is some level of recognition of the association of the diabetic state with increased incidence of atherosclerotic disorders and their complications. The use of aspirin here appears to be largely prophylactic while prescriptions of other co-administered drugs appear to be co-incidental. Record of drugs co-administered with anti-diabetic /anti-hypertensive pharmacological agent where observed at Eku Baptist and Warri Central Hospitals only where these set of patients were encountered (Table 8). The most frequently prescribed classes of drugs were low dose aspirin. anti-malarial, NSAID's, vitamins, anxiolytics (Diazepam/Lexotan), which represented 20.55%, 19.18%, 13.69%, 13.69% and 10.96% respectively of the total number of prescriptions [73]. Other less commonly prescribed drug classes included antibiotics and anti-diarrhea agents constituting 8.21% and 6.89%. This pattern once again reflects a possible attempt by medical practitioners in the health institutions to prevent thrombo-embolic complications among this setof patient. Also the observation that the prescription frequency for low dose aspirin in this set of patients (20.55%)is comparatively higher than those of hypertensive-only (13.3%) and diabetic-only patients (14.2%) also suggests some level of awareness of the comparatively higher risk for atherosclerotic disorders and their complications in this patient set compared to the other two, by health care givers in these health care institutions. The recognized stronger association between psychological stress and hypertension compared with diabetes may explain the higher prescription rate for anxiolytics among hypertensive-only and hypertensive/ diabetics compared to diabetic only

set of patients observed in this study [19].

Supporting this suggestion is again the fact that the few recorded attempts to estimate the lipid profiles of patients assessed were observed also in Eku Baptist Hospital and Central Hospital Warri where these set of patients were encountered in this study.

There is also an observed high prescription rate for anti-malarial and NSAID's in diabetic/hypertensive patients as for the previous groups of patients.

High rates of prescription of anti-biotic, anti-malaria and anti-diarrhea as well anti-emetics again might be as a result of the higher susceptibility to parasitic and infections disease which could be as a result of high glycemic levels from poorly controlled diabetes. This study also suggest that there is very high tendency to prescribe vitamins by health care givers in all the institutions as the rate of prescription remain high across the different classes of patients- hypertensive-only (15.4%)diabetic-only (21.9%), and 13.69% in diabetic- hypertensive(Tables 6,7 and 8)

CONCLUSION

This study conclude that medical practitioners in different health institutions are strongly aware of the associated risk for atherosclerotic vascular disorder and its complications among hypertension-only, diabetic-only and diabetic hypertensive patients suggested by their frequent prescription of prophylactic low dose aspirin for these set of patients. It also revealed

a very low request level for laboratory determination of lipid profile in these patientsets in the studied areas. It suggests that lipid profile assessment in this class of patient was more likely to be conducted in urban and semi-urban bigger health facilities than rural or the university health centers.

The study also revealed a general low level of prescription of lipid lowering drugs in the sampled population and this could either suggest low level of use of these pharmacological agents as prophylactic measures against atherosclerotic vascular disorders and their complications or widespread resort to non-pharmacological control measures.

Recommendation

Further retrospective and prospective studies using a larger sample population and more health facilities should be done and health care practitioners in these part of the world should be educated on the importance of lipid profile determination and use of lipid lowering drugs in reducing the morbidity and mortality from atherosclerotic vascular disorders in hypertensive and diabetics .

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