

EVALUATION OF DRUG USE AMONG DIABETIC HYPERTENSIVE PATIENTS IN A TEACHING HOSPITAL

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ABSTRACT

The major approach to patients' health problems is the use of drugs particularly in the co morbid states. In this study we intend to evaluate the prescribing pattern, determine the nature and extent of irrational drug use and assess rate of medication adherence and reasons for non adherence among patients attending an outpatient clinic of Olabisi Onabanjo University Teaching Hospital (OOUTH) Sagamu, Ogun State, Nigeria.

A two fold study was done using 100 case notes belonging to diabetic hypertensive patients of whom 67 patients were available for oral interview on medication adherence.

Data on sex, age, groups of medicines prescribed, number of prescriptions and number of medicines occurring per prescription were obtained, World Health Organization (WHO) prescribing indicators were calculated and occurrence of irrational prescribing was detected. Analysis was done using Microsoft Excel 2000.

Female to male ratio was 1:0.59 and average age \pm SD of the patients was 63 \pm 10 years. Anti diabetics were the most prescribed medicines 1152(31.8%) followed by anti-hypertensives 865(23.9%). Average no of drugs per prescription was 4.7; Percentage of drugs prescribed as generics 40.1%; Percentage of antibiotics and injections per prescription were 9.4% and 2.1% respectively. Extravagant prescribing occurred in 92.7% of the cases.

Forty nine (73.1%) were adherent. Cost (63.2%) and forgetfulness(15.7%) were reasons for non adherence.

Prescribing in this group of patients is sub-optimal, however majority claimed to be adherent. Interventions are needed for health care providers and the patients alike.

Keywords: Diabetic Hypertensive, Drugs, Adherence

Introduction

Diabetes and hypertension are common diseases of great importance and their management requires attention, both clinically and pharmacologically.

Hypertension is extremely common co morbidity in patients with type 2 diabetes mellitus. The coexistence of hypertension in patients with type 2 diabetes is particularly destructive because of the strong linkage of the two conditions with cardiovascular diseases (CVD), stroke, progression of renal disease and diabetic

nephropathy^[1].

While non pharmacological interventions for managing diabetes and the associated co morbidities are integral to the treatment plan, in reality, the cornerstone of management remains pharmacotherapy^[2]. It is known that multiple antihypertensive medications are required to achieve the aggressive blood pressure goals recommended for diabetic patients^[3-4]. These coupled with the need to keep both blood glucose and pressure levels controlled, make the patients prone to the use of multiple drugs which may be rational or not.

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Medicines are used rationally when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and their community [5-6]. Rational medication prescribing dictates that the fewest medications be used to achieve the therapeutic goals as determined by clinician and patient. Multiple medications not only add to the cost and complexity of therapeutic regimens, but also place patients at greater risk for adverse drug reactions and drug- drug interactions [2].

Worldwide, it is estimated that over half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take their medicine correctly [5-7]. Inappropriate use and over use of medicines waste resources- often out of pocket payments by patients and result in significant patient harm in terms of poor patient outcomes and adverse drug reactions. It can stimulate inappropriate patient demand, and lead to reduced access and attendance rates due to medicine stock outs and loss of patient confidence in health system [8]. It can also reduce the quality of life and cost of health care is unnecessarily increased.

Medication adherence is another issue among patients with diabetic hypertensive patients, as they are often required to take multiple medications in addition to antihypertensives [1], non-adherence results in significant morbidity and mortality and is a financial burden to the health service. From the foregoing there is then a need to constantly review drug use by diabetic hypertensive patients.

In this study we intend to evaluate the prescribing pattern and how it relates to or varies from the WHO prescribing indicators, determine the nature and extent of irrational drug use and assess rate of medication adherence and reasons for non adherence among diabetic hypertensive patients attending an outpatient clinic of a teaching hospital.

MATERIALS AND METHOD

Location

The study was conducted in the Medical out Patient Clinic of Olabisi Onabanjo University Teaching Hospital, Sagamu in Ogun State (OOUTH). OOUTH is a 218 bedded teaching hospital formerly known as Ogun state teaching hospital located in Sagamu Ogun State Western Nigeria.

Study design

A two fold study using case notes (retrospective) and oral interview (prospective) was carried out

Study Population/sample size

This consisted of diabetic patients whom have been diagnosed as having hypertension attending the medical outpatient clinic of OOUTH.

One hundred case notes were consecutively selected and this served as the sample size.

Sixty seven of these patients were available for oral interview on their medication adherence.

Data Collection

A data collection format was designed to aid collation of data.

Case notes

Data on sex, age, groups of medicines prescribed, number of prescriptions and number of medicines occurring per prescription were obtained. World Health Organization's prescribing indicators i.e. average no of drugs prescribed, percentage encounter of these drugs as generics, percentage occurrence of injections and percentage occurrence of antibiotics were calculated.

Occurrence of irrational prescribing was detected using parameters in Appendix 1 [9].

Structured oral interview

To test for patients use of drugs prospectively, sixty seven of the patients whose case notes were evaluated

consented to answering the question, “Do you always use your drugs as prescribed by the doctor?” and reasons for non use were also obtained from them.

Data Analysis

For easy sorting all data obtained were entered into Microsoft Excel 2000 and cross-checked for accuracy. The data collected were analyzed to obtain averages, percentages and standard deviations. Values obtained were compared with International network on rational use drug (INRUD) parameters (WHO Prescribing indicators) and critical reasoning on information obtained from appendix 1 were used to determine the types of irrational prescribing that occurred in each encounter.

Ethical Issue

Permission was sought and obtained from the health facility before commencement of study and oral consent was also sought from patients before questioning.

RESULTS

Among the 100 case notes of the diabetic hypertensive patients, only 97 were usable, being case notes with sufficient information for the study giving a response rate of 97%. Results obtained are shown below:

Socio Demographic Characteristics.

The females were 61(62.9%) and male patients were 36(37.1%) giving a female to male ratio of 1:0.59. Three (3.1%), 22(22.7%), 35(36.1%) and 37(38.1%) were in the age groups 35-45years, 46-55years, 56-65years and >65years respectively. The average age \pm SD of the patients was 63 \pm 10 years. Fifteen (22.4%), 21(31.3%), 15(22.4%) and 16(23.9%) had no formal education, primary, secondary and tertiary education respectively, 12(17.9%), 4(6.0), 35(52.2) and 16(23.9) were skilled, semi-skilled, unskilled and retired persons respectively. Thirty two (47.8%), 14(20.9%) and 21(31.3%) of the encounters had 1-5, 6-10 and >10 years as duration of illness.

Distribution of Drugs Prescribed

The distribution of the drugs prescribed into their therapeutic groups is shown on Table 1.

WHO Prescribing Indicators.

Average number of drugs per prescription

A total of 777 prescriptions were obtained from the case notes. On analysis, they contained 3625 number of medicines with an average of 4.7 medicines per prescription. The number of medicines in the prescription ranged from 2-12. Table 2 shows the values for prescribing indicators obtained versus the WHO standard.

Insulin was the most prescribed injectable, others include antimalarials and antibiotics.

Table 1: Distribution of medicines into their therapeutic groups.

| Therapeutic Group | Number | Percent |
|--------------------|--------|---------|
| Antidiabetics | 1152 | 31.8 |
| Anti-hypertensives | 865 | 23.9 |
| Analgesics | 735 | 20.3 |
| Heamatinics | 317 | 8.7 |
| Antibiotics | 73 | 2.0 |
| Sedatives | 64 | 1.77 |
| Antidepressants | 54 | 1.49 |
| Antimalarials | 50 | 1.4 |
| Others | 315 | 8.6 |

Table 2: Values obtained for prescribing indicators versus WHO standards. N=777

| Prescribing Indicator | Values Obtained | WHO Standard ^[10] |
|--------------------------------------|-----------------|------------------------------|
| Average no of drugs per prescription | 4.7 | 1.6-1.8 |
| % of drugs prescribed as generics | 40.1% | 100% |
| % of Antibiotics per prescription | 9.4% | 20-26.8% |
| % of injections per prescription | 2.1% | 13.4-24.1% |

Occurrence of irrational prescribing

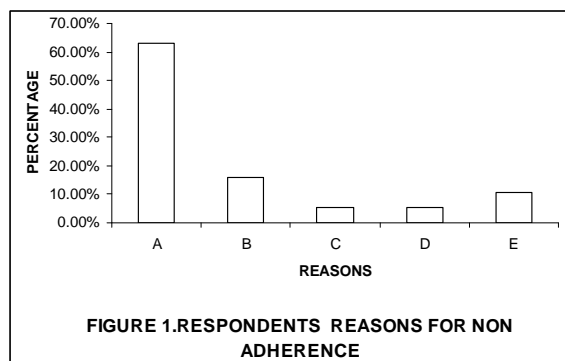
Table 3: shows forms of irrational prescribing that occurred aside polypharmacy. Three hundred and eighty three(49.3%) had between 2 and 4 medicines(minor polypharmacy) while the remaining 394(50.7%) had 5 or more drugs, indicative of major polypharmacy.

Table 3: Percentage Distribution of Irrational Prescribing

| Type | Number | Percent |
|--|--------|---------|
| Extravagant prescribing | 720 | 92.7% |
| Over Prescribing | 3 | 0.4% |
| Incorrect Prescribing | 13 | 1.7% |
| Multiple Prescribing(Major Polypharmacy) | 394 | 50.7% |
| Multiple Prescribing(Minor Polypharmacy) | 383 | 49.3% |
| Under prescribing | Nil | Nil |

Use of medicine as prescribed

Forty nine (73.1%) of the patients agreed that they use their drugs as prescribed by the doctor while eighteen patients (26.9%) agreed that they did not use their medicines as prescribed by the doctor. Reasons for non use are shown in Figure 1.



KEY- cost of drugs-A, Forgetfulness-B, Dislike of drug-C, Misinterpretation of prescription-D, Others-E

DISCUSSIONS

Majority of the encounters had one form of education or the other and about half were unskilled workers. Majority of the patients were elderly, this shows age trend of the disease and the need for attention on this age group.

The study revealed polypharmacy in these patients with an average number of drugs per prescription being 4.7. This deviates from WHO standard of 1.6-1.8 and is not surprising as it is recognized that patients with diabetes mellitus are generally prescribed more drugs than other patient^[11] probably because of their co morbid states. Polypharmacy, unfortunately is very common in Nigeria^[12-17] and some other countries^[18-19].

It results in increased cost of treatment, which may lead to non-adherence by patients as they have more medicines than they can cope with. It also increases the risk of significant adverse drug interactions.

For rational drug prescribing in diabetic hypertensive patients, it is important to note that many forces tend to add to the drug regimens. Given the frequency of co morbidities and compelling evidence for treatment of each condition, it is likely that the average patient will require multiple medications to achieve therapeutic goals. Thus, the goal of therapy should be to treat all pertinent medical problems using the most appropriate drug regimen, including issues of efficacy, dose frequency, side effect profile, drug interaction potential and cost^[2].

It may be advisable for pharmacist to discuss the availability of once-daily single tablet, fixed dosage combinations to reduce pill burden and improve adherence^[1].

The WHO standard for generic prescribing is 100%, this study showed a low rate of generic prescribing as was also observed in a study by Williams et al^[20].

This implies that the prescribers deviate from the standard by prescribing proprietary or branded drug products. It also implies that patients have to buy the prescribed branded drugs and this in turn increases the possibility of unavailability of the medicines to patients and increase in cost of medicines prescribed.

Prescribing by generic name allows flexibility of stocking and dispensing various brands of a particular drug that are cheaper than and as effective as proprietary brands. This is the basis of essential drug list use^[21].

The value obtained for antibiotic use fell in the range prescribed by WHO, This is recommendable. Diabetic patients are more prone to infections than non-diabetic patients due to the high blood glucose levels which favor the growth of microorganisms. In a study carried out on the infective complications in Nigerian diabetic patients, it was found that the most common were cutaneous and subcutaneous (40.8%) followed by pulmonary(32.4%) and urinary tract infections^[22].

In this study, most of the antibiotics prescribed were given for upper respiratory tract infections (URTIs) especially cough, the rest were given for cutaneous and subcutaneous infections.

This is however different from the results of the previous study stated above. The percentage of antibiotics encountered was low. This indicates good control of the blood glucose levels of the patients and that abuse of antibiotics is quite minimal among the patients under study.

The use of injectables fell in the recommended range given by WHO with insulin been the most prescribed injectable. This may be because diabetic patients who have hypertension usually have type II diabetes which is mostly managed with oral hypoglycemics agents. Patients that cannot be controlled with oral

hypoglycemic agents are then treated with insulin, given subcutaneously.

This result is similar to that obtained in a study by Adibe et al^[21] and contrast with others^[12-13,23].

A large percentage of the prescriptions were extravagant. This is because brand names of medicines were prescribed where less expensive generic equivalents are available, e.g. Daonil for Gilbenclamide. This could be because the prescribers are more conversant with the brand names than generic names of the drug products. Also pressure from the medical representatives of the branded products to prescribe their own brand may have contributed immensely to this high rate.

This form of irrational drug use brings about high economic burden on the patients who have to buy the branded products at a higher cost than a generic with the same bioequivalence. Increased cost of medications could however lead to non adherence due to non affordability by some patients, leading to failure in achieving good therapeutic outcome, which is elimination or suppression of medical conditions and symptoms.

It also indicates that branded drug products are being stocked in the pharmacy and this is not in line with the principles of the essential drug concept which stipulate that drugs must be affordable.

Over prescribing (when medication is prescribed when not needed by the patients.) occurred in very few prescriptions. This was determined by comparing the prescriptions given to the patients with the present complaints made by the patients.

This low value (0.4%) may have resulted from failure of the prescribers to document other complaints made by the patients that permit the use of such medications

The other forms of over prescribing could not be determined because of the varying individual requirements of each patient. For example, over prescribing that occurs when dose is too large (when

smaller doses would do). The doses prescribed for one patient may be too large for another patient due to varying individual pharmacokinetics.

However the dose prescribed for all patients were not greater than the maximum doses allowed for therapeutic effects. This is recommendable.

Incorrect prescribing (when no therapy is indicated) occurred in few of the prescriptions where antibiotics were prescribed for cough and common cold instead of cough syrups and nasal decongestants respectively.

Under prescribing was not encountered in any of the prescriptions analyzed. The need to ensure that patients receive medications that meet their individual clinical requirements makes it difficult to set a particular standard for dosages and the length of treatment (appendix 1).

The foregoing calls for educational intervention on rational drug use especially on generic prescribing for doctors, pharmacist e.t.c

Patients self reports can simply and effectively measure adherence [24-25]. In this study majority of the stated that they use their drugs as prescribed by the doctor. These results do not agree with the compliance rate of about 50% suggested in patients with chronic illnesses on long term treatment regimen [26]. For a confirmation there is need for further studies where other methods of measuring adherence such as pill counts, assessing clinical outcomes, ascertaining rates of refill e.t.c may be employed.

Majority of the respondents gave high cost of medications as reason for not adhering to their medications given. Forgetfulness, dislike for medicines and misinterpretations of prescriptions among other reasons were also given. The high cost of medication may be due to the extravagant prescribing observed in the study, which exhibited as non generic prescribing.

Similar results were obtained in a study by Enwere et al [27].

Conclusion

The study indicates that rational prescribing of drugs is not yet optimal among the groups of patients studied, as the results obtained do not meet the standards set by the World Health Organization. The rate of adherence to medication among patients studied is encouraging but not yet optimal.

Educational interventions on rational use of drugs are needed for all stakeholders and further studies are needed on adherence.

Appendix 1- Types of irrational drug use

| Types of irrational drug use | Occurs if a drug is prescribed when |
|------------------------------|---|
| a) Extravagant Prescribing | -a less expensive drug would provide comparable efficacy and safety -Symptomatic treatment of mild conditions diverts funds from treating serious illness -a brand name is used where less expensive equivalents are available |
| b) Over prescribing | -The drug is not needed -The dose is too large -the treatment period is too long -The quantity dispensed is too great for the current course of treatment. |
| c) Incorrect prescribing | -the drug is given for an incorrect diagnosis -the wrong drug is selected for the indication The prescription is prepared improperly -adjustments are not made for coexisting medical , genetic, environmental or other factors -the use of correct drugs but by incorrect administration |
| d) Multiple prescribing | Two or more medications are used when one or two would achieve virtually the same effect -Several related conditions are treated when treatment of the primary condition will improve or cure the other conditions. |
| e) Under prescribing | -needed medication are not prescribed -Dosage is inadequate -length of treatment is too brief |

Adapted from working party, Council of Europe, 1976

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Article History:-----

Date of Submission: 12-09-10

Date of Acceptance: 22-12-10

Conflict of Interest: NIL

Source of Support: NONE