PHARMACOECONOMIC EVALUATION OF ANTIHYPERTENSIVE THERAPY USING COST OF ILLNESS ANALYSIS IN OLABISI ONABANJO UNIVERSITY TEACHING HOSPITAL ,SAGAMU, OGUN STATE

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Abstract

The major problem that prompted the study is the lack of adequate consideration for cost in drug selection and scarcity of facts on actual cost of illness to the patient and the society at large.

To evaluate the impact of antihypertensive therapy on our limited resources, using Cost of Illness Analysis. Also to know the costs attributable to each component of cost of illness as well as the total cost due to each type of prescribed antihypertensive drugs over a specified period. On the overall, to serve as baseline data for policy and decision makers when planning for the various intervention models and for the society to be more informed on why life style modification is essential to minimize the incidence.

It is mainly retrospective using patient case notes, in addition to stop- watch time studies and standard cost accounting technique. The various cost components such as drug procurement, transport, personnel and diagnostic costs over one year period were determined for each patient and added up. These were summed up to calculate the cost of illness analysis for all the patients considered and the average determined.

Most commonly used drugs were nifedipine, methyl dopa, aspirin and lisinopril. The range of costs of illness among the patients over one year period was N1,026.80 to N84,395.15. The total cost for the randomly sampled 39 patients over one year period was =N1,391,520.00 giving an average cost of illness per patient per year of N35,680.00. With an estimated 10%-12%(13.28-15.94 million) prevalence rate of hypertension in rural and urban Nigeria respectively the cost of illness associated with hypertension in the country may be as high as N473, 142, 628,800 i.e. over N450 billion (US $3.38 billion) per annum. This exclude costs associated with intensive care hospitalization in some case(s), indirect cost due to lost wages by the patients and care givers, cost of research as related to hypertension and administrative costs.

Conclusion: Adequate cost consideration is important in drug selection, as the cost of illness associated with hypertension among other diseases is enormous to the society. A concerted effort is needed to increase effectiveness, improve efficiency, minimize costs and reduce incidence of hypertension.

Key words: Pharmacoeconomics, Cost of Illness Analysis, Hypertension

Introduction

Pharmacoeconomic evaluation of therapy is increasingly being advocated even in developed countries[1,2] but this is yet to be so in Nigeria and other African countries where resources are much more limited.[3] Previously, emphasis is basically .on clinical outcomes of therapy with little critical consideration for economic and psychosocial outcomes.[4] This research article is focusing on economic outcome of therapy using Cost of Illness Analysis (CIA).[5]

It has been shown that 85% of the global mortality and disease burden from cardiovascular diseases of which hypertension is the most prevalent is borne by low and middle-income countries like Nigeria[6] where the percentage of core poor in 1999 was as high as 58.2%.[7] The prevalence of hypertension in the country is put at 10%-12 % in rural and urban parts respectively.[8,9] More so, the fact that it has to be managed for life in a larger number of patients compound the problems of cost for the patients and the society.

CIA shows the cost of the condition in question (hypertension in this case) to the society over a period of time.[10] It is pure cost analysis and health consequences are not evaluated. All costs caused by the condition are added up but not incremental costs. Cost Effective Analysis (CEA) is less applicable for combination therapy. Also the true cost implication to the society can only be from CIA.

Cost of illness is the sum total of all the costs (direct and indirect) associated with an illness. The cost of an illness is the sum of three components: (1) the medical resources used to treat the illness (hospital care, professional services, drugs, and supplies), (2) the non-medical resources associated with it (transportation, lodging for family during treatment etc), and (3) the lost productivity due to illness or disability (indirect costs). A fourth category, the intangible cost of pain and suffering, is often unquantifiable.

The cost implications if known with certainty can be a motivating factor towards improved policy by government, as well as better perception, and appreciation and possibly improved compliance culture by health professionals and the society both to medication as well as to life style modification. On the overall there should be better utilization of already scarce resources.

Method

It is mainly a retrospective study. In addition, time and motion Studies were employed.[11]

The location of the study was Olabisi Onabanjo University Teaching Hospital Sagamu, Ogun State. The study addressed Hypertensive Out Patients attending the cardiology clinic.

It involved reviewing 475 prescriptions. These were the prescriptions of antihypertensive medications for 39 randomly sampled case notes over one year period (July 2003 to June 2004). The following data were noted and recorded from the case notes; demographic data, date of visits, blood pressure at each visit, concurrent illness (s), number of visits and prescribed antihypertensive drugs at each visit as well as duration of therapy. Evidence of diagnostic tests was also noted and recorded.

Only the direct costs were considered. These include the costs for personnel, drugs, transportation and diagnostic tests.

Time and motion studies was carried out to calculate the personnel costs for

physicians, pharmacists and nurses.[11] Average time for 15 random observations for completion of tasks such as consultations, dispensing, and measurement of blood pressure was determined and recorded. The salary of health professionals were obtained from the accounts department of the hospital, average considered where necessary and the mean salary per minute calculated.

$$\text{Mean salary/min} = \frac{\text{annual salary}}{\text{Hours/wk x no of wks/annum x60}}$$

In the calculation the respective number of visits were considered.

Also computed were the transport costs for each patient for all the visits using the standard tariff of National Union of Road Transport Workers (NURTW) and the patients destination. This was obvious from the stated address of the patients in the case notes. Drug costs were obtained from the pharmacy department of the hospital and the cost per defined daily dose (C/DDD)[12] calculated taking the duration of therapy into consideration. In addition the cost of diagnostic tests were obtained from the laboratory of the hospital. All these costs were added up for each patient and for all the patients to obtain the total. The average cost per patient was then calculated and recorded.

Results

TABLE 1: COST OF ILLNESS PER PATIENT OVER ONE YEAR PERIOD

No of Visits per year	No of patients in each class	Respective no of prescriptions for each patient per year	Total no of prescriptions for all the patients	Average no/ type of antihypertensive drugsper patient	Total cost of illness (N)	Average cost of illness per visit/prescription (N)	Average cost of illness per patient (N)
1-5	3	2,4,5	11	3.7	45,180.50	4,107.32	15,060.17
6-10	9	7,8,9,9,9,10, 10,10,10	82	3.3	257,130.70	3,135.84	28,571.00
11-15	19	11,11,11,11,12,12,12, 13,13,13,13,14, 14,14,14,15,15	243	4.0	837,414.00	3446.15	44,074.44
16-20	8	16,16,17,17,18, 18,20	139	4.1	251,794.80	1811.47	31,474.35
Total/ Average	39	475	475	3.8	1,391520.00	2,929.50	35,680.00

Range of cost = N1026.80 (lowest) N84,395.15 (highest)

Total cost for 39 patients in one year=N1,391,520.00
Average cost per patient per year= N35,680.00

TABLE 2: TOTAL COST OF INDIVIDUAL DRUGS FOR THE 39 PATIENTS

Drug	Total cost N	% of Total drug cost	% of Total cost of illness	No of patients	% of Patients
Captopril	28,700.00	2.28	2.06	2	5.13
Frusemide	2,164.00	0.17	0.16	5	12.82
Nifedipine	484,090.00	38.48	34.79	27	69.23
Lisinopril	340,290.00	27.05	24.45	19	48.72
Methyldopa	260,940.00	20.74	18.75	16	41.03
Atenolol	41,550.00	3.30	2.99	6	15.38
Poltthizide/ Prazosin	3,700.00	0.29	0.27	2	5.13
Amiloride/ Hydrochlorothiazide	86,319.00	6.86	6.20	27	69.23
Propranolol	3,552.00	0.28	0.26	3	7.69
Aspirin	2,812.00	0.22	0.20	34	87.18
Hydrochlorothiazide	2,762.00	0.21	0.20	3	7.69
Dipyridamole	1,260.00	0.10	0.09	1	2.56
Total	1,258,139.00	100	90.41	39	100

TABLE 3: COST OF ILLNESS

Cost components	Total costs in 39 patients (N)	% of Total cost of illness
Drug	1,258,139.00	90.41
Transport	47,880.00	3.44
Diagnostic tests	4,000.00	0.28
Overhead costs	81,501.00	5.87
Total	1,391,520.00	100

Discussion

The total cost of illness for the period under review (July 2003-June 2004) for 39 only patients was N1, 391,520.00 giving an average cost per patient of N35,680.00 per annum. This takes into account only the direct cost of therapy; the procurement cost of drugs, transport cost, cost of diagnostic test(s), and personnel costs of health

professionals. The range of the cost was N84,395.15 to N1,026.80. Average cost per visit per patient is N2,929.50 while average number/type of antihypertensive drugs used was 3.77 indicating combination therapy in most patients at all time.

Of the total cost of illness the drug acquisition costs accounted for N1,258,139.00 (90.41%) hence any modality that could reduce the cost of drugs attributable to hypertension whilst the patient still receives optimal therapy is highly beneficial to the society. Example of such measure is pharmaceutical care, which can improve patient compliance thereby reducing the need to step-up dosage regimen or preventing erroneous change by the prescriber to a much more expensive agents.

Nifedipine with a cost per DDD of between N20-N40 depending on prescribed dosage regimen has the largest share of drug cost; N484.090.00 (38.79%) as it was prescribed for 27 patients (69.25%) second only to aspirin. This was followed by lisinopril (C/DDD = N60-N120) with a cost of N340,290.00 (27.05%) and prescribed for 19 patients (48.72%).

Co-amilozide (C/DDD = N6.00) was just N86,319.00(6.86%) even though it was equally prescribed to 27 patients(69.25%) like nifedipine. There is always the need to try the cheaper options before graduation to the newer and more expensive options provided there is no specific contraindication. There was no evidence of such in most reviewed cases. This is a cause for concern as most Nigerian patients are poor, and a good number of hypertensive patients are retirees. Prescribers need to be more enlightened on the cost implications of their action to the patients and the society. Regularly up-dated Standard Treatment Guidelines and functional drug formulary, which applied evidence based practice and economic evaluation consideration is indispensable to optimize therapy with limited resources.

Low dose aspirin was prescribed in 34 patients (84.28%) undoubtedly, for its cardio-protective effects. This is in accordance with the report of Joint National Committee on Prevention, Detection, Evaluation and Treatment of high blood pressure.[13] The cost of aspirin was just N2,812.00 (0.2%).

The fact that poverty is on the increase in Nigeria is no longer new. The percentage of the core poor, rising from 6.2% in 1980 to as high as 29.3% in 1997 and reaching 58.2% in 1999 is a cause for concern.[7] Also with the estimation that 93.2 million Nigerians out of total population of 132.8 million[14] live below the poverty line earning less than US $1(about N140.00) per day[14] is worrisome. These coupled with poor infrastructure make it imperative to seek any avenue that can ensure better utilization of resources.

With an estimated 10%-12%(13.28-15.94 million) prevalence rate of hypertension in rural and urban Nigeria respectively[8,9] and with an average cost of illness in the study of N35,680.00, per patient cost of illness associated with hypertension in the country may be as high as N473, 142, 628,800 i.e. over N450 billion (US $3.38 billion) per annum. This exclude cost associated with intensive care hospitalization in some case(s), indirect cost due to lost wages by the patients and care givers, cost of research as related to hypertension and administrative costs.

Since low-income earners are also affected,[1] the cost of therapy can only worsen their quality of life, as they may not be able to procure adequate regimen hence poor compliance. If they strive to procure from their limited earnings, their standard of living would be adversely affected. If they rely on relatives, it is still a societal problem.

Therefore, adequate measures need to be taken by all stake- holders, to prevent/minimize the incidence of problems and optimize therapy to lessen the cost associated with therapy. The patient and the society should be made to know the cost and health implications of the disease conditions among others. This in turn would increase compliance both to drug as well as non-drug therapy. Pharmaceutical care practice in neighbourhood pharmacy, hospital pharmacy and through home visits can also help to improve and facilitate desired outcome of therapy while promoting better utilization of limited resources.

Conclusion

Costs associated with management of hypertension among other diseases to the society, is enormous. Therefore, the patient, health professional, government and the society at large should be made to know the cost implications as well as the grave implications of non compliance to guidelines. This probably will improve their seriousness in all ramifications, particularly in public enlightenment campaigns. Up-dated formulary, and standard treatment guidelines which include economic considerations is absolutely mandatory to utilize available resources more efficiently.

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