Pharmaco-epidemiological Studies on Self Medication and Drug Utilization Pattern in Chronic Diseases via Prescription Auditing

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Abstract. Prescription auditing, a sort of vigilance activity is an important tool in pharmaco-epidemiological studies to get a clear picture about rational usage of drug, widely prescribed drugs, extent of polypharmacy, and the most prevalent diseases in a particular area. With the changing dynamics of the lifestyle, behavioral pattern, socioeconomic and educational status an increasing trend of self medication observed in both rural and urban dwellers. Till yet there is no such report about the drug utilization pattern or extent of self medication practice in the Kharaghpur area. A study was conducted in Kharagpur region of India (Block 1 and 2) to determine the drug utilization trend and practice of self medication in the prevailing disease conditions by prescription monitoring and exit interviews with pretested Performa on customers randomly visiting the pharmacies. Prescription auditing showed that disease prevalence was predominant in age group of 11.00±6.25–50.00±9.75 and comparatively less incidences in the pediatrics (1.00±1.05–5.00±0.79) and geriatrics (70.00±1.31–75.00±1.01). There was a predominance of infectious diseases like fever, cough and cold during the study period followed by asthmatic problems and gastrointestinal infections GIT infections in the surveyed area. Self-medication of asthma and GIT infections was more prevalent in urban population (60%, n=133) as compared to the rural population (33.89%, n=107). Easy availability of lifestyle drugs, enhanced education levels amongst urban population and economic hindrance to pay physicians fees, influences of peer groups, advices from pharmacists, difficulty to avail drugs from clinics in rural regions influenced self medication. Analgesics, antipyretics were the most widely used self medicating drugs in survey area.

Key words: Prescription auditing; vigilance activity; self medication; poly-pharmacy; drug utilization; asthma; GIT infections; analgesics; antipyretics

1. INTRODUCTION

Pharmaco-epidemiology refers to epidemiological studies of the clinical use of drugs, their effects and side effects in large population mass with the purpose of promoting cost-effective rational use of drugs so as to achieve better health outcomes of the common mass (Sjokvist and Birkett, 2003; Sills et al., 2009; Prasant et al., 2013). Prescription auditing or monitoring is an important mechanism to improve the quality of care afforded by the physicians both private practitioners and the public hospitals. It is a sort of vigilance activity which refers to the collection of prescriptions and gathering of information’s relating to widely prescribed drugs, extent of poly-pharmacy and the existing drug utilization pattern (Aitken et al., 2009; Abidi et al., 2012; Bhattacharya et al., 2012; Potharaju et al., 2011; Ndungu et al., 2007; Jyoti et al., 2013). Drug worth crores of rupees are consumed every year but a substantial amount of such drugs is irrationally prescribed (Abidi et al., 2012). Recent trends have shown increasing incidences of self-medication in both rural and urban populations. Self medication is the “use of drugs or Pharmaceutical products by the consumer to treat self recognized disorders or symptoms or the intermittent or continued use of the medication prescribed by the physicians for a chronic or recurring diseases or symptoms” (Widayati et al., 2011). Self medication is multi-factorial (Chawla et al., 2013; Bimo et al., 1995; Chaudhuri et al., 2011; Krishnaswamy and Kumar, 2005; Patel et al., 2012; Pisarik, 2010; Pandey et al., 2010). Unintentional administration of xenobiotics including heavy metals also affects human health along with irrational use of drugs (Saedi et al., 2013).

Different socio-economic implications, unavailability of registered medical practitioners (RMPs) in remote areas, increasing cost of medical treatments, inability to pay physician’s fees, long waiting hours in clinics or other medical facilities, advices from peer groups and pharmacists greatly promotes self medication in rural areas. In urban areas, ready access to drugs from several medical stores, rapid growth of mass medias, television and newspaper advertisements, internet facilities and easy availability of lifestyle drugs are important.
2. MATERIALS AND METHODS

The epidemiological survey of prescription monitoring was carried out in three hospitals in and around IIT campus. Bidhan Chandra Roy Technology hospital (BCRTH), situated within the campus premises of IIT Kharaghpur, India funded by IIT institute. Prembazar Rural hospital situated just outside the campus and Kharaghpur State hospital with all medical departments funded by West Bengal government.

A two-year (1st March, 2011-1st March, 2013) prescription audit was carried out after taking consent of CMO to collect data from prescription records of patients visiting the out-patient department of the three hospitals. The study protocol was a modified version of prescription-monitoring Performa Annexure-2 recommended by WHO (Bimo et al., 1995). The parameters in the protocol Performa included demographic, anthropometric and therapeutic details of the individual patients. For assessment of self medication, patients attending the clinics of consultants and approaching the pharmacy stores were interviewed after taking their verbal consent during the same study period. Interviewed patients included were from rural and urban areas of Kharaghpur. In the surveyed area local agents or field staffs appointed by the research team contacted the patients attending three pharmacies attached to the hospitals included in study as well as eleven community pharmacies in the adjoining areas of the three hospitals. In addition, for data collections regarding self medication the co-operation of the owners of the community pharmacies, appointed or working pharmacists were also sought by the research group.

The data were collected using the pre-designed Performa: (1) duration and details of illness, (2) signs and symptoms, (3) medications used for self medication, (4) reasons for self medications, (5) sources of advices as regards self medication, (6) medications concurrently used along with self medications along with the socio-economic and (7) demographic details of the patients. The detailed protocol is shown in Table 1.

After compilation, the data were classified in to different independent variables, tabulated and percentages were calculated. The statistical calculations like mean and standard deviations (±SD values) were done and Pie charts were plotted using Microsoft Excel-2007 Software. Analysis of 2X2 contingency tables was performed with the aid of GraphPad statistical software.

### Table 1: Protocol Performa for recording patient details

<table>
<thead>
<tr>
<th>Name of the patient</th>
<th>Nature of disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of the patient- Rural/Urban</td>
<td>Duration of disease</td>
</tr>
<tr>
<td>Age of the patient</td>
<td>Signs and symptoms</td>
</tr>
<tr>
<td>Sex- M/F</td>
<td>Drugs prescribed</td>
</tr>
<tr>
<td>Religion</td>
<td>Mode of administration- oral/parenteral/inhalational</td>
</tr>
<tr>
<td>Body weight</td>
<td>Treatment sought- Private practitioner/hospital attached</td>
</tr>
<tr>
<td>Body Mass Index (BMI)</td>
<td>Self medication- yes/no</td>
</tr>
<tr>
<td>Education</td>
<td>Reasons for self medication</td>
</tr>
<tr>
<td>Occupation /Income</td>
<td>Sources of advice for self medication</td>
</tr>
<tr>
<td>Smoking/Alcoholism- yes/no</td>
<td>Medicaments concurrently used along with self medications (if any)</td>
</tr>
</tbody>
</table>

3. RESULTS AND FINDINGS

Amongst the collected prescriptions for the purpose of audit the results of demographic analysis of patients showed 58% male, 32% female and 10% child. Patient age-wise distribution of collected prescriptions showed that disease prevalence was predominant in age group of 11.00±6.25–50.00±9.75 and comparatively less incidence in the pediatrics (1.00±1.05–5.00±0.79) and geriatrics (70.00±1.31–75.00±1.01). Division of prescriptions according to duration, disease conditions and prescribed drug category are presented in Fig.1-3.

Prescription auditing showed predominance of infectious diseases followed by significant number of asthmatic incidences and GI-tract infections. Out of 100 prescriptions audited, poly-pharmacy was noticeable compared to single drug therapy. However in poly-pharmacy two drug combinations were mostly used than three or four drug combinations (Fig.4).
For assessing the prevalence of self medication, 225 responses were recorded of which 118 and 107 were from urban and rural population respectively. Out of total persons approached (n=225), the self-medication was predominant in female population (n=133; 59.11%) than that of male population (n=92, 40.8%), combinedly in rural and urban population. In urban areas (n=118), it was observed that 60% of drug purchasers were self-medicating based on drug information from television, news, advertisements and internet and 22% relied on pharmacist order and 11% of the drug purchasers were undergoing chronic treatment without prescription (advised by other layman) in contrast to those of rural areas (n=107), where it was observed that 33.89% were forced to go for self medication due to economic hindrances, 38.11% relied on Pharmacist’s advice, 22.11% were influenced by peer groups and only 5.89% were dependent on internets, drug advertisements etc (Fig.5-6). In rural areas persons self medicating mostly relied on pharmacist order and some drug purchasers were undergoing chronic treatment without prescription advised by other layman. Mostly widely used categories of drugs for self medication were: analgesics, anti-pyretics and antimicrobials. However sedatives and hypnotics were rarely used (Fig. 7). From the view point of self-medication over the counter (OTC) sale of antimicrobial drugs constituted mostly broad-spectrum antibiotics such as tetracycline, chloramphenicol, cotrimoxazole (80%). Other category of drugs sold were antifungal (10%), antimalarial (2.5%), anti-amoebic (2.5%), antiviral (2.5%) and anti-helmintic (2.5%). Statistical analysis of data showed prolonged intake of certain drugs for chronic diseases was 35.11±7.05%. About 27.11±6.34% were showed prolonged intake of certain drugs for chronic diseases was 35.11±7.05%. About 27.11±6.34% showed that among the asthmatics’ prescriptions, salbutamol, terbutaline), and methyl xanthenes (theophylline and etophylline) were used. Prescription auditing showed that among the anti-asthmatics’ salbutamol, beclomethasone, montelukast was mostly prescribed. Poly-pharmacy was widely prevalent especially in case of fever, cough, cold, asthma, GIT infections followed by diabetic incidences.

4. DISCUSSION

The present investigation was aimed at monitoring the drug utilization pattern of general therapy in outpatient department of three hospitals in Kharaghpur area. In the study period (1st March, 2011-1st March, 2013), prescription auditing showed that there was a predominance of infectious diseases like fever, cough, cold, followed by asthma problems and GIT infections in the surveyed area from March-July. There was significant number of asthmatic cases. The age groups of 11.00±6.25–50.00±9.75 years were found more prone to diseases. This is an alarming situation to be considered for health awareness since this is the most productive age group in the development of the nation. Economic hindrances, illiteracy or semi-literacy, reluctance about hygiene were major causes of infectious diseases noticeable mostly among the rural patients. Smoking habits were found strongly correlated with the incidence of asthma and were found mostly common amongst male population involved in the occupations of constructions (masons and painters), gardeners, security guards, peons, and clerical staff from the adjoining rural areas of Kharaghpur. Some incidences of smoking related asthma were also observed amongst the educated urban class of Kharaghpur region.

Most of the prescriptions were of seven-day duration. Drug utilization pattern indicated that, the most commonly used drug categories were antibiotics followed by anti histaminics, vitamins, analgesics, antipyretics, antihypertensives, expectorant-mucolytics, antitussives, antiamoebics and antiprotzoal. Most commonly used antibiotic was amoxycillin. Nimesulide and ibuprofen were the most commonly used analgesics and aspirin and paracetamol were used as antipyretics. Amongst antacids H$_2$- antagonists like ranitidine and famotidine were predominating along with aluminium and magnesium salts containing antacid suspensions like Gelusil MPS®. Cetirizine was most popular among anti-histaminics although corticosteroids (beclomethasone), β₂-agonists (salbutamol, salmeterol and terbutaline), and methyl xanthenes (theophylline and etophylline) were used. Prescription auditing showed that among the anti-asthmatics’ salbutamol, beclomethasone, montelukast was mostly prescribed. Poly-pharmacy was widely prevalent especially in case of fever, cough, cold, asthma, GIT infections followed by diabetic incidences.
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Fig. 1: Distribution of prescriptions according to the duration

Fig. 2: Distribution of prescriptions according to disease condition

Fig. 3: Distribution of prescriptions according to drug category
Fig. 4: Prevalence of poly-pharmacy amongst the audited prescriptions

Fig. 5: Reasons of self-medication in urban population

Fig. 6: Reasons of self medication in rural population
In self-medication practice urban population was much ahead of their rural counterpart. Easy availability of OTC drugs, wide advertisement by mass media publicity, access to internet and enhanced education levels were the major contributing factors of self-medication in urban areas. The survey found that pharmacists’ advices were preferred by rural patients for self-medication followed by influences from peer groups in contrast to the urban population. However in rural population, inability to pay physician fees, lack of RMPs, and disrupted communication for avail of drugs from clinics, non-availability of drugs in hospitals, gaps in health care infrastructure and failure of many primary health centers (PHCs) to provide minimum health needs prompted the rural patients to undergo self-medication.

5. CONCLUSION

Prescription auditing is one of the scientific methods to assess and evaluate the rationality of the prescription. Current research via prescription auditing helped to form an idea about the drug utilization trend in the surveyed area during the two-year study period. The prescription based survey showed a predominance of infectious diseases in the month of March-July with increasing incidences of asthma. Hence physicians in this area whether attached to government hospitals or private practitioners should be encouraged to follow asthma guidelines while managing asthma patients and come forward for the successful implementation of interventional health programs like National Asthma Education Program in improving asthma knowledge, necessity of smoking cessation, generate mass awareness for improvement of personal hygiene, diet and lifestyle which may be beneficial as an initial step for protection against infectious diseases like GI-infections (Pandey et al., 2010).

Self-medication is an element of self care when it is related to nutrition, healthy lifestyle and hygienic practices but can have disastrous far reaching consequences when it comes to contraindications and serious adverse drug reactions (Chawla et al., 2013; Krishnaswamy and Kumar, 2005). Self care is obviously the primary source of any health care system (Krishnaswamy and Kumar, 2005). When patients are making decisions about the use of non-prescription drugs, the highly trained pharmacists could play a pivotal role in helping people make correct choices about self care, optimum selection and utilization of drugs. Pharmacists can provide drug information on possible side effects; duration of use; contraindications and possible interactions (Sjokvist and Birkett, 2003; Sills et al., 2009; Chawla et al., 2013; Patel et al., 2012; Pisarik, 2010). Medicines used for self-medication must be of desired quality, efficacy and proven safety and is desirable to use in disease conditions that are self-recognizable or if used in case of chronic conditions it should be used following initial medical diagnosis (Pisarik, 2010; Abidi et al., 2012; Bhattacharya et al., 2012; Pandey et al., 2010; Jyoti et al., 2013).

It is highly recommended that there should be definitive therapeutic drug monitoring system for close monitoring of drug utilization pattern by the pharmacist in the outpatient departments (OPD) of the hospitals for the proper guidance of the patients. Government should enforce distinctions between prescription and non-prescription drugs simultaneously imposing strict sales policy for preventing the dispensing of prescription drugs without prescription to the self-medicator. Pharmaceutical industries while advertising and marketing non-prescription drugs should never make any false claim on efficacy, rather they should provide accurate information and exhibit fair balance between benefits and risks involved. In no cases companies for promotion of sales should encourage irresponsible self-medication.
Finally it can be concluded that such pharmacoepidemiological studies are essential to know about the drug utilization trend and thus improve the quality of public health care through rational usage of drugs. Boosting public health programmes and health management, monitoring of drug utilization pattern, development of evidence based essential drug list, targeted in-service training and public awareness are some of the strategies which can be adopted to ensure rational drug use (Krishnaswamy and Kumar, 2005).

The proper channelization and combination of pentagonal forces of physicians, patients, pharmacists, pharmaceutical industries and policies could make all necessary resources available to develop a healthy environment (Krishnaswamy and Kumar, 2005; Chawla et al., 2013).

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REFERENCES


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