Jordan Journal of Pharmaceutical Sciences, Volume 3, No. 2, 2010

Analgesic Prescribing In Developing Countries

Nousheen Aslam[1], Muhammad Harris Shoaib[2], Rabia Bushra[1]

[1] Department of Pharmaceutics, Ziauddin College of Pharmacy, Ziauddin University, 4/B Shahra-e- Ghalib, Clifton, Karachi- Pakistan.
[2] Department of Pharmaceutics, Faculty of Pharmacy, University of Karachi.

ABSTRACT

Prescription writing is the key part in healthcare provision. This study aims to find out the current prescribing practice for the analgesics in tertiary health care centers situated in Karachi.

Cross sectional, random sampling method was used to collect 1000 medicine chart of patients from different hospitals in the metropolitan city of Karachi from July to December 2008.These charts were reviewed to get Information about patients' demography, reason for hospitalization, medications, number of analgesics. Different variables were determined in this study including the gender and age group of majority patients taking analgesics with their prescribing frequency, combination analgesics and different prescription errors. Results are expressed in frequency and percentage.

1000 medicine charts were reviewed. Five thousands eight hundreds and ninety one drugs were prescribed out of which 1,084 were analgesics (18.4%), 821(75.7%) were non opioids and were 263 (24.26%) opioids. Analgesics were more prescribed to females (N=564; 56.4%) than males (N=436; 43.6%). The most prevalent age groups was between 11 to 30 years (N=263; 26.3%) and 31 to 70 years (N=200; 20%). Paracetamol was the most frequently prescribed analgesic (N=340; 34%) followed by opioids (N=263; 26.3%), acetic acid NSAIDs? derivatives (198; 19.8%), aspirin (175; 17.5%), propionic acid NSAIDs derivatives (N=56; 5.6%) and fenamic acid NSAIDs derivatives (N=52; 5.2%). Paracetamol and aspirin were commonly prescribed in combination with other analgesics. The most common prescription errors were omission of weight of patient (N=174; 17.4%) and strength of tablet (N=136; 13.6%), wrong dosage form (N=116; 11.6%) and omission of route of administration (N=104; 10.4%).

Keywords: Analgesics, Rational Prescribing, Prescription Error, Developing Countries, Karachi, Pakistan.

INTRODUCTION

Drug prescribing is a major activity of doctors, but there are evidences that drugs are not always prescribed rationally [1]. Expenditures due to irrational use of drugs have been a strain on the meager health budgets and inappropriate prescribing has been identified in many health facilities in developing countries [2]. The audit of prescribing pattern is a component of medical audit, which seeks monitoring, evaluation and necessary modifications in the prescribing practices of prescribers to achieve rational and cost effective medical care for the patients[3].

Received on 21/10/2009 and Accepted for Publication on 22/3/2010.
✉ E-mail:harrisshoaib2000@hotmail.com.

The process of prescribing has gained a lot of interest because of ever increasing drug costs and the concern for rational prescribing from a clinical point of view. In 1752, the famous Swedish physician and botanist Carl von Linne mentioned 21 different reasons for irrational prescribing, including factors like outdated knowledge, wrong diagnosis and chemical incompatibility, which are still relevant aspects when assessing rationality of prescribing. Today irrational prescribing would include things such as prescribing a drug that has no significant medical effects or whose expected side effects exceed the benefits of the drug, prescribing of irrational combination of drugs, drugs that interact with each other, prescribing excessive quantities or improper dosage. Prescribing expensive drugs when cheaper drugs are available could be considered irrational as would continue unnecessary medications for years. Many physicians base selection of medicines on their own experience, which may not be an accurate base for rational selection [4.] In a study different prescribing errors were identified as inadequate medication dosing duration; omission of patient's age, drug dosage, and duration of drug use; improper dosage and prescription of those drugs that could adversely interact [5].

Analgesics are the agents that relieve pain, but they do not "cure" the cause of pain, instead they alter the perception or interpretation of pain message, and one may still experience the pain [6.] It is difficult to justify the use of analgesics on a large scale, taking into account that prolonged and excessive use of analgesic compounds may be a potential hazard [7]. Many studies show that analgesics are the therapeutic agents which are largely prescribed in all types of patient care settings [8-11]. Numerous studies have illustrated that many of the NSAIDs, both the selective cyclooxygenase-2 inhibitors and the traditional non-selective agents, may confer similar risks of cardiovascular toxicity. Although these agents may still be useful in many patients, concerns over side effects have begun to limit their use, and patients and clinicians are reaching for alternate agents[12]. Taking into account all these factors, this study aims to determine the prescribing practices of analgesics in tertiary health care centers in the metropolitan city of Karachi-Pakistan.

METHODS

Sample and Sample size: 1000 medicine charts of different patients were collected through cross sectional random sampling method from July, 2008 to December, 2008. There was no specification of any disease to be included in this study. These medicine charts were reviewed to gather information about patients' demography (age, sex and weight), reason for hospitalization, medications, name and number of analgesic drugs being used by the patient.

Data Evaluation: For the ease of data evaluation analgesics were placed in different groups as: acetyl salicylic acid (aspirin), acetaminophens (paracetamol), acetic acid derivatives (indomethacin, diclofenac, ketorolac), propionic acid derivatives (ibuprofen, naproxen, fluibiprofen, ketoprofen, oxaprozin), fenamic acids (meclofenamates, mefenamic acids) and opioid analgesics (nalbuphin HCl, tramadol, dextropropoxyphene HCl).Different prescriptions error categories were designed (Table 1) according to the prearranged definition of Prescription errors[13].

Variables: The prescribing practice by the physicians in local tertiary care centers in Karachi was determined by evaluating different variables such as the number of males and females with most prevalent age group taking one or more analgesic, most commonly prescribed analgesic or group of analgesic, rationality of prescribing the opioid analgesics. Omission errors (for all the drugs in medicine chart); these errors include omission of age, weight, dose and route of administration. Prescribing an analgesic which is contraindicated (with patient's disease state and/or other drugs), correct indication for prescribing an analgesic, correct dose and frequently prescribed combination analgesics [14 -16].

RESULTS

5,891 drugs were prescribed in 1000 medication orders. The average number of drugs per script was 5.891. Among these drugs 1,084 were analgesics (18.4%). The non opioids were 821 (75.7%) and opioids were 263 (24.26%). Analgesics were more prescribed to females (N=564; 56.4%) than males (N=436; 43.6%).

These analgesics were prescribed to patients of almost all age that is below 1 year (N=64; 6.4%), 1 to 10 years (N=148; 14.8%), 11 to 30 years (N=263; 26.3%), 31 to 50 years (N= 224; 22.4%), 51 to 70 (N= 192; 19.2%), 71 to 90 (N=109; 10.9%). All patients of less than 1 year were receiving paracetamol in suppository form. All drugs were prescribed by the trade name according to the formulary of the hospital. Different analgesic agents were prescribed with different frequency. Paracetamol was the most frequently prescribed analgesic (N=340; 34%) followed by opioids (N=263; 26.3%), acetic acid derivatives (N=198; 19.8%), aspirin (N=175; 17.5%), propionic acid derivatives (N=56; 5.6%) and fenamic acid derivatives (N=52; 5.2%). It was also noticed that within the same group of analgesics some were more frequently prescribed than others (Table II). Paracetamol was mostly prescribed in case of fever and pain. Diclofenac sodium and opioids were mostly prescribed in post operative treatments such as lower section scissirion segment (LSCS) and other surgical procedures as total abdominal hyperectomy (TAH), lapratomy, colostomy reversal and hysterectomy.

Some analgesics were commonly prescribed in combination with others (Table III). Different prescription errors were also evaluated in percentage (Figure I). No interaction was found between analgesic agent and any of the drugs which were concomitantly administered to the patients. There was no case of prescribing an analgesic in case where it is contraindicated.

DISCUSSION

Effective analgesic therapy begins with an accurate assessment of the pain. The Initial Pain Association Tool and the Brief Pain Inventory can help the clinicians assess pain[17] . The selection of analgesics must be individualized for each patient, depending on the cause and chronocity of the pain as well as patients' age and concomitant medical conditions that may alter the drug response[18]. Prescribing habits and quality in most of the South Asian countries is poor, with overuse of antimicrobials and irrational use of fixed-dose combination therapy [19]. In present study, 5,891 drugs were prescribed in 1000 prescriptions (5.891 drugs per script). One prescription for multiple drugs is the common practice found during this study. This finding reveals that in Karachi many drugs per script are prescribed irrespective of the fact that increased number of drugs used by patients may increase the risk of potentially hazardous drug interactions [20]. A large number of patients were of age between 31 to 90 years which were prescribed analgesics. Clinical decisions making in these patients is usually not an isolated event rather it continues over the given course of illness and often includes intervals of relatively good health [21]. During the study two types of doctors were observed. First type was highly skilled but more tactless while the second type had more genuine concern towards patients. The prescribing practice of these two types of prescribers was different. The first type of doctors did not use to listen to the patients while the second type used to do as many a time frequent change of medicines from one class to another or from one drug to another of the same class was noticed. These observations can anticipate that listening to the patients carefully may help the physicians to prescribe more rationally and genuinely.

All drugs were prescribed by trade names. Among different analgesics paracetamol was the most frequently prescribed drug in all ages in different dosage forms i.e. tablets, syrups, suspensions and suppositories. In addition it was most commonly prescribed with opiod analgesics. Opioids were the next class of analgesics which was most frequently prescribed as injectables. Diclofenac from acetic acid derivatives were mostly prescribed by the doctors in emergency care in injectable form for the relief of pain. Diclofenac sodium and different opioids were largely prescribed in case of surgeries for post operation analgesia. Ibuprofen and ponstan were least prescribed drugs both in the form of tablet and oral suspensions. The study also explores that gastro protective agents were less prescribed with analgesics like ibuprofen which have proved tendency to cause gastric irritation.

It was observed that in some prescriptions more than one analgesic were prescribed. It is best to avoid

combination therapy with more than one non-opioid analgesic because there is little evidence of extra benefit to the patient as compared to the additive side effects. Sometimes the combinations are no more effective than their components even in single dose. These combinations are a real and necessary alternative to NSAIDs gastrointestinal hemorrhage potential [22] and therefore they should not be prescribed in combination to the patients who may get GI hemorrhage by the use of NSAIDs.

Omission of weight of patient was the most frequently occurring prescribing error. In some patients the nursing staff assumed the patient's weight from his/her age, height and physical appearance and this "hypothetical weight" is used for dose calculation. In many cases the physicians did not write correct strength of the drug but they wrote "take 1 tablet" or omitted the strength. Administration of a medicine in incorrect dose or in more doses than prescribed may lead to overdose [23]. The correct dose is essentially to be mentioned for the desired therapeutic effects of prescribed drugs as the success of treatment depends on the particular quantity and particular moment one administer it [24]. This error was common in patients of age between 11 to 30 years. The omission of strength especially in case of a drug available in more then one strength contributes to the irrational use of drugs as pharmacist may not judge the correct dose of the drug for several reasons. Errors involving omission of or incorrect route of administration were also very common. Children (5 months to 1 year) and patients of age 80 years and above were more exposed to this error. In many cases children were prescribed a tablet instead of a syrup or suppository which is the best dosage forms in this age group. Similarly the patients on N. G feeding (Naso Gastric feeding) were prescribed tablets while the syrups could be easier to administer or the injectables could be a choice because of the absence of any chance of drug interaction. A correct prescribed drug can show its efficacy when it is given in correct dose by correct route of administration. In case, the route of administration is not mentioned, many pharmacies dispense drug according to the age of patient written on the medicine request form sent to them.

Analgesic medications are often prescribed concurrently with other drugs to enhance analgesia or to treat pain exacerbation. These adjunctive medicines are most often used in the management of chronic pain, particularly when the dose of primary analgesic has been optimized and to reduce the side effects such as excessive sedation, nausea and vomiting or constipation. In majority of these analgesics were adjunctively prescribed with orphenadrine citrate, corticosteroids, anti histamines, antidepressants and narcoleptics were the adjunctive drugs with analgesics. So many medicines are prescribed to a patient some of which may be avoided because it overburdens the patients with increase in hospital stay, cost of therapy, length of treatment and chances of hospital acquired infections which all together increase the disease burden of a patient.

CONCLUSION

The study heralds that in the use of analgesics is very common in Karachi, largely populated city of a developing country. There are no local guidelines available for the prescribing of these drugs. The overall prescribing practice shows negligence towards some basic information on the medicine chart which needs careful attitude of physicians towards prescription writing to avoid possible adverse drug events by prescription errors. It is an urgent need of time that the prescribers must pay attention towards rational prescribing of analgesic drugs. The co prescribing of combination analgesics must be avoided as much possible. Prescribing the correct analgesic with correct dose, route of administration and adjunctive drugs is very necessary to obtain the benefits of analgesic therapy.

Table I: Categories for Prescription Error

ERROR NUMBER	DESCRIPTION OF ERROR
Error 01	writing wrong dosage form
Error 02	writing ambiguous medication order
Error 03	writing "1 tablet" instead of mentioning the strength of the drug/ in correct strength
Error 04	Omission of route of administration.
Error 05	prescribing medicines without using "metric system"
Error 06	incorrect or ambiguous use of abbreviations
Error 07	wrong decimal placements
Error 08	writing milligram instead of micro gram or gram
Error 09	omission of age of patient
Error 10	omission of weight of patient
Error 11	prescribing a drug which has potential antagonistic interaction with the analgesic agent (drug-drug interactions)
Error 12	prescribing contraindicated analgesic

Table II: Most Frequently Prescribed Analgesics among the Same Group

Group of analgesics	Most frequently prescribed drugs	Number of prescriptions	Percent (%)
Acetic acid derivatives 198*	Diclofenac sodium/ potassium	175	75.7
Propionic acid derivatives 56*	Ibuprofen	34	60.7
Fenamic acids derivatives 52*	Mefenamic acid	52	10.0
Opioids	Nalbuphin HCl	94	35.7
	Tramadol	75	28.5
	Dextropropoxyphen	76	28.89

* Total number of prescriptions

Table III: Combination Analgesics

Class of analgesics	Drug name	Combination analgesics
Acetyl salicylic acid	Aspirin	Ponstan, Panadol
Para amino phenol	Panadol	Dsiprin, Nalbuphin HCl Tramadol, Diclofenac sodium/potassium
Acetic acid derivatives	Diclofenac sodium/ potassium	Nalbuphin HCl, Panadol Ponstan, Dextropropoxyphen Ketorolac, Tramadol
Fenamic acid derivatives	Mefenamic acid	Panadol, Dsiprin

Class of analgesics	Drug name	Combination analgesics
Opioids	Nalbuphin HCl	Panadol, Diclofenac sodium/potassium
	Tramadol	Panadol, Diclofenac sodium/potassium
	Dextropropoxyphen	Panadol, Diclofenac sodium/potassium

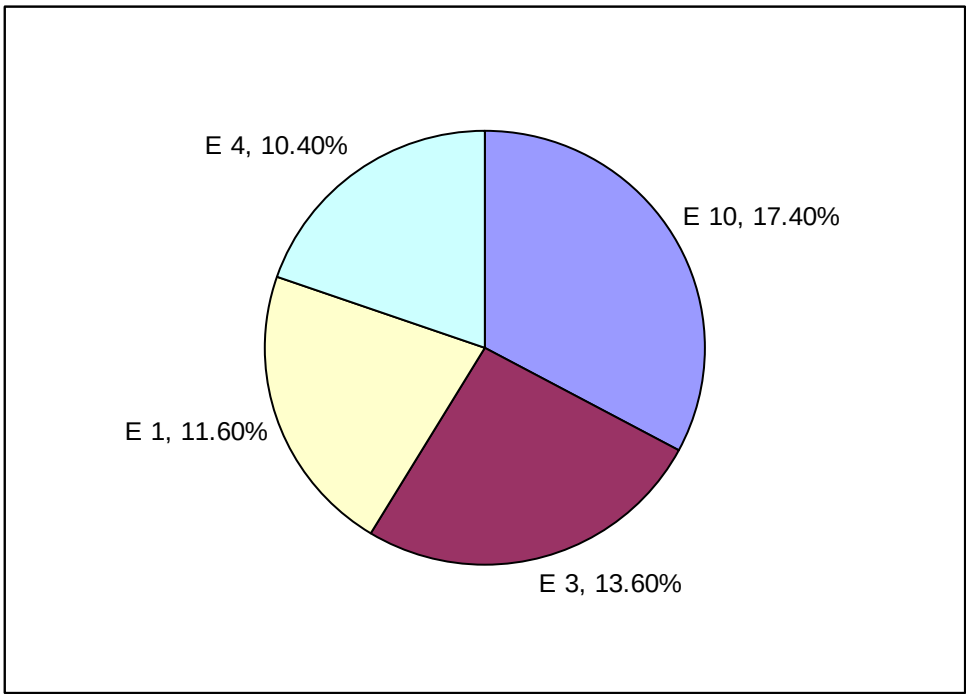

Figure I: Percent Occurrence of different Prescription errors

E 10 (omission of weight of patient), E 3 (omission of strength of tablet), E 1(wrong dosage form), E 4 (omission of route of administration)

REFERENCES

(1) Ahmed, K.Z. Saadi ABR.A survey of multiple prescriptions dispensed in Saudi Arabia, ***Pak J Pharm Sci .*** 2005;18:1-2.

(2) Akande, T.M. Ologe MO. Prescription pattern at a secondary health care facility in Ilorin, Nigeria. ***Ann Afr Med.*** 2007;6:186-9.

(3) Das, B.P. Sethi, A., Nutan, K., Gunjan . Teaching exercise of drug utilization by medical students. ***JNMA J Nepal Med Assoc***. 2005; 44:160-4.

(4) Enlund, K.H. Social and behavioral aspects of Pharmacy, In: ***Pharmaceutical practice***. Edited by Winfield A.J, Richards RME,. Edinburgh : Chrchill Livingstone: 2007: 26-27.

(5) Oshikoya, K.A., Ojo, O.I. Medication errors in paediatric outpatient prescriptions of a teaching hospital in Nigeria. ***Nig Q J Hosp Med***. 2007;17(2):74-8.

(6) Mollem, S.A., Mood, K.B, Mood, M.B. Opioids and opiates, In: ***Hand book of drug interaction***, a clinical and forensic guide. Totowa: Human Press Inc; 2000:123.

(7) 7. Scanzello CR, Moskowitz NK, Gibofsky A . The post-NSAID era: what to use now for the pharmacologic treatment of pain and inflammation in osteoarthritis. ***Curr Pain Headache Rep***.2007;11: 415-22.

(8) Fernández-Liz, E., Modamio, P., Catalán, A., Lastra, CF., Rodríguez, T., Mariño, E.L. Identifying how age and gender influence prescription drug use in a primary health care environment in Catalonia, Spain. ***Br J Clin Pharmacol***. 2008; 65:407-17.

(9) Sarkar, C., Das, B., Baral, P.An audit of drug prescribing practices of dentists. Indian J Dent Res.2004;15:58-61.

(10) Desta, Z., Abula, T., Beyene, L., Fantahun, M., Yohannes, A.G., Ayalew, S.Assessment of rational drug use and prescribing in primary health care facilities in north west Ethiopia. ***East Afr Med J.*** 1997;74:758-63.

(11) Mahfouz, A. A., Shehata, A.I., Mandil, A.M., Al-Erian, R.A., Al-Khuzayem, A. A., Kisha, A. Prescribing patterns at primary health care level in the Asir region, Saudi Arabia: an epidemiologic study. ***Pharmacoepidemiol Drug Saf***. 1997; 6:197-201.

(12) Bennett, P.N., Brown, M.J. ***Clinical Pharmacology. India***: ***Churchill Livingstone***; 2005; 19-338.

(13) Dean, B.What is Prescribing error?. ***BMJ***, 2000; 9; 232-237.

(14) Smith, K.E., Enright, S.M. Providing a framework for ensuring medicine use safety, In: Remington: The Science and Practice of Pharmacy. Edited by Gennaro AR. 21st ed. Philadelphia: Lippincott William Wilkins; 2005;1857.

(15) Rovers, J.P. Patient Data Evaluation, In***: A Practical Guide to Pharmaceutical Care***, 2nd ed. New York: New York APhA Press; 2003;52-62 .

(16) British National Formulary. 41st ed. ***Royal Pharmaceutical Society of Great Britain***: 2001; 4.

(17) Reisner, L., Koo, PJS .Pain and its management. In:Applied therapeutics, the clinical use of drugs. Edited by Kimble MAK, Young LY, Kradjan WA, Guglielmo BJ, Alldredge BK, Corelli RL. 8th ed. Philadelphia, Lipponcott William and Wilkins;2005;1-40,9-10.

(18) Hanson, G.R. Analgesic, Antipyretic and Anti inflammatory drugs, In: Remington: the science and practice of dosage form. Edited by Gennaro AR .20th ed. Philadelphia: Lippincott, William and Wilkins; 2000;1454-1456.

(19) Cave, W., Pandey, P., Chatterjee, S. Irrational prescribing in South Asia: a case of fluoroquinolone-associated phototoxicity***. J Travel Med***. 2003; 10: 290-2.

(20) Frusks, Luox, Hutchinson, P., Higgins, J.N. Evaluation of a method to reduce over the counter medication dosing error, ***Arch Paeditr aolesc Med***. 2006; 58: 620-4.

(21) Goh WMH and Dhillon RS. The doctor-patient-family relationships. In: Practical guide to Geriatric Medicines. Ratnaike RN editor. The Mc GrawHill Companies Inc. Sydney, New York.2002;14-24.

(22) Shiappoli, M., Gani, F., Frati, F., Marcucci, F, Seena. Asthma and aspirin. Recenti Prog Med. 2003; 94: 79-87

(23) Tipao Kuitunen, Pia Kuisma and Kalle Hoppu. Medication errors made by health care professionals. Analysis of the Finished Poison Information Centre data between 2000 and 2007. ***Eur J Clin Pharmacol***. 2008; 64: 769-774

(24) Bonnemain, B.H., Frank, J.B. From Rome to Byzantium, In: ***History of Pharmacy. Paris***: Paris Asclepios Press; 2003;60.

وصف المسكنات في الدول النامية

نوشين اسلام[1]، محمد حارس شعيب[2]، ورابيا بشرى[2]

[1] كلية ضياء الدين للصيدلة، جامعة ضياء الدين.
[2] قسم الصيدلانيات، جامعة كراتشي.

ملخـص

تعد كتابة الوصفات من أهم المفاتيح في الرعاية الطبية المسبقة. تهدف هذه الدراسة الى ايجاد الممارسة الحالية في كتابة الوصفات للمسكنات في المراكز الطبية الثلاثية المنتشرة في كراتشي.
تم أخذ عينات عشوائية ومقاطع عرضية لجمع 1000 مخطط دوائي لمرضى من مستشفيات مختلفة في حاضرة مدينة كراتشي من تموز إلى كانون الأول من عام 2008. تمت مراجعة هذه المخططات للحصول على معلومات عن المرضى، والديموغرافيا ، وسبب دخول المستشفى، الأدوية، وعدد المسكنات. تم تحديد عوامل مختلفة في هذه الدراسة مثل الجنس وسن غالبية المجموعة التي تتناول المسكنات وتكرار الوصفة، وتوليفات المسكنات مع أخطاء الوصفة المختلفة. تم التعبير عن النتائج بالتكرار والنسبة المئوية.

الكلمات الدالة: مسكنات، استرشاد الوصفات، أخطاء الوصفة، الدول النامية، كراتشي، باكستان.

تاريخ استلام البحث 2009/10/21 وتاريخ قبوله للنشر 2010/3/22.