Journal of

Pharmacology and Toxicology

ISSN 1816-496X

Academic
Journals Inc.

www.academicjournals.com

Journal of Pharmacology and Toxicology 5 (7): 382-388, 2010
ISSN 1816-496X / DOI: 10.3923/jpt.2006.33.39

Physicians' Attitude Toward Injectable Medicines*

[1,2]A. Majid Cheraghali, [1]Fatemah Solemani, [1]Yasna Behmanesh, [1]Fatemeh Habibipour, [1]Asqar Ismaeilzadeh, Shokoufeh Nikfar[1] and Weria Rahimi[1]
[1]Department of Food and Drug, Ministry of Health,
[2]Department of Pharmacology, University of Baqiyatallah Medical Sciences, Tehran, Iran

Abstract: Overuse of injections is a common characteristic of health system in many developing countries. The high frequency of injections could not be justified according to appropriate use of this dosage from of medicines. However, it seems that in different cultures of developing countries different factors involve in this malpractice. It is clear that attitude of both prescribers and patients significantly influence prescription of injectable medicines. In this study 30 general practitioners working in different public health centers randomly selected and their attitude toward injections was evaluated using a questionnaire. Physicians were categorized in low and high prescription rate groups. Doctors prescribing injections higher than 30% allocated in high rate prescribing. A questionnaire contains questions about reasons for prescribing injections has been developed and used for interview of physicians. Eighty one percent of high rate prescribers and 54% of low rate prescribers believe patient's demand is the major factor on driving them toward prescription of injections. Equal percent of high and low rate prescribers prescribe injections to respond to patient's request for faster treatment. Both groups believe that the lower quality and efficacy of oral dosage forms compared to injections is a driving force for prescribing injections. Only 19% of the high rate prescribers declared financial incentives as an important factor for prescribing injections. In contrary to low rate prescribers, 19% of high rate prescriber think improper university training is a factor on prescribing injections. Results of this study show that prescribers' attitude toward injections clearly differ. Therefore before implementing any interventions to improve injections use, attitude of prescribers should be investigated. Although prescribers indicated educating patients and training prescribers influences rational use of injections, both groups suggested some managerial interventions as useful tools for overcoming the problem.

Key words: Injectable medicines, Iran, rational use of medicines, physicians' attitude

Introduction

Since Alexander Wood introduced the use of a hollow needle for direct injection of opioids to treat neuralgia (Brokensha, 1999), this practice has become increasingly popular both in developed and developing countries. However, nowadays overuse of injections is only a common characteristic of health systems in developing countries (Hutin *et al*., 2003). Recent surveys in developing countries revealed that annual ratio of injections per person in these countries ranged from 1.7 to 11.3. Overall the annual number of injections per person was 3.4. The high frequency of injections reported could not be justified according to appropriate use of this dosage form of medicines

Corresponding Author: Majid Cheraghali, Department of Pharmacology, University of Baqiyatallah Medical Sciences, Aghdasyyeh, Tehran 19945, Iran Tel: 9821 88156085 Fax: 9821 88156080

Originally Published in Journal of Pharmacology and Toxicology, 2006

(Hutin *et al*., 2003). Not only are vast numbers of injections unnecessary and unsafe but they have also been linked to the possible transmission of millions of cases of viral hepatitis B and C and significant cases of HIV infections (Reeler, 2000). Unnecessary injections may expose patients to the risks originated both from substances injected and their possible biological or physical contaminations (Montaseri, 2005).

In different cultures of developing countries the belief in injections as a very powerful method of restoring or maintaining health is shared by both professionals and lay people. In fact, the problem of injection use seems to be so complex that it cannot be solved by training alone. Knowledge of the potential risks of injections is often not put into practice (Bhattarai and Wittet, 2000). In some countries health workers are confronted with patients who prefer injections to oral medications. The historical background of this popularity of injections may be the significant cures achieved with injections such as antimalaria medicines and antibiotics. However, economic factors may also determine their widespread use. Compared to oral dosage forms injections are often more expensive and it is evident that some providers may demand a higher income for administering an injection. Doctors may also believe that by prescribing injections to patients and satisfying their demand, they may return to their office for next consultation.

Despite the fact that injections are overused in developing countries, there is still not a concrete response why injections are so popular in these countries. There are different factors involve in this malpractice in different countries (WHO, 1996, 1994a; b). In a published report differences between injections use status in Uganda and Indonesia has been investigated (WHO, 1996). There is a marked difference between the two countries with respect to the source of the injections received. The bulk of the injections received in the Indonesia originate from the public sector. In contrast, in Uganda only a minority of the injections had given in the government health facilities. In both countries the high rate of injection use in uncomplicated, non severe and self limiting illness are found, indicating medical inappropriateness of injection use. The researchers concluded that in these countries injections are popular because of local beliefs about illness and concept of efficacy, economic interests of private providers and lack of patient-provider communication (WHO, 1996).

The abuse of injections also has economic consequences. Poor families spend their scare resources on injections in situations where the money could have been better spent on other essentials. Health systems also have to pay for this unnecessarily expensive form of medicine administration in spite the fact that oral dosage forms would be more appropriate and carry less risk to the patients (Reeler, 2000). Despite the usefulness of some injections e.g., vaccinations or in treatment of cases where patients are not able to swallow or are nauseated, most injections given in developing countries health settings are medically unjustifiable.

Iran is a country of over 68 million populations with a fairly advanced health system based on universal coverage of primary and secondary care. This has significantly improved availability and affordability of medicines in Iran. However, there is convincing data indicating irrational use of medicines (Cheraghali *et al*., 2004). It has been reported that more than 40% of patients who visited a doctor received at least one injection (Cheraghali, 2003; Shalviri *et al*., 2004).

Attitude of both physicians and patients significantly influence prescription of injectable medicines. Although many doctors believe they prescribe injectable medicines because of patient's demand, it seems there is a misunderstanding about patient's demand. However, this perception has major influence on physician practicing behaviour. Despite the fact that most of published data have studied interventions to improve prescribing habit of doctors with high prescription rate of injectable

medicines, there are suggestions that evaluation of attitude of physician with proper prescribing habit may also provide valuable data for improvements (Anonymous, 2004). Therefore in this study attitude of physicians toward prescribing injectable medicines has been evaluated.

Materials and Methods

Choose of health centres for sampling was based on method described previously (Cheraghali *et al*., 2004). Briefly, in 2004 health centres in five provinces of Iran randomly selected according to their geographical distribution in these provinces. Thirty prescriptions of each physician working in these centres were randomly selected and prescription rate for injectable medicines was calculated simply by dividing total number of injectable medicines prescribed to total number of medicines in prescriptions and expressed as percentage. According to these value physicians were categorized in low and high prescription rates. The border line was 30% and doctors prescribing injections higher than 30% allocated in high rate prescribing. The borderline has been selected arbitrary and it is based on data obtained from previous surveys of pattern of prescribing medicines in Iran (Cheraghali *et al*., 2004). Then thirty physicians, regardless of their gender or prescribing pattern, were randomly selected for in depth interview. A questionnaire contains questions about reasons for prescribing injections has been developed and used for interview. Of these 30 physicians one declined the interview and 16 were in high rate (>30%) prescribing group and 13 in low rate prescribing injections group. Table 1 shows gender distribution of each group.

Results

Seven identical questions were asked from all physicians. High rate physicians were asked for reasons why they prescribe injectable medicines and their responses are shown in Table 2. Majority of high rate group believe that patients' belief has the major impact on their prescribing behaviour and they think they prescribe injections to ensure patients' compliance. However, they do not believe an economical benefit is an important contributory factor in prescribing injections. They also believe that their training in university was fairly appropriate for their practice.

This group also stated following as major disadvantages of injectable medicines:

- Higher price of injectables
- Pain and stress from injections
- Higher risk of adverse effects
- Needs to specific training and equipments

The physicians then asked about their opinion on effective interventions to improve situation. Responses from high rate group are summarized in Table 3. Although this group sees patients' education about disadvantages of injections as the most important factor on improving the situation, they do not believe that explaining efficacy of oral dosage forms of medicines to the patients could help. However, they also suggested that managerial interventions such as restriction on prescription of injectables would be an improving factor.

Similar questions were asked from low rate physicians and their responses are summarized in Table 4. In contrary to high rate group 54% of this group believe that patients' demand has a major

Table 1: Gender distribution of physicians interviewed

Group type	Male	Female	Total
High rate	9	7	16
Low rate	4	9	13
Total	13	16	29

Table 2: Reasons for prescribing injectable medicines by high rate physicians (n = 16)

Question	No. of yes responses	Distribution of responses based on physician's gender	
		Male	Female
Do you think patient's belief has major impact on your prescribing habit	13 (81%)	6	7
Do you prescribe injection to ensure patient's compliance	8 (50%)	4	4
Do you prescribe injection to satisfy patient's request for faster treatment	5 (31%)	4	1
Do you prescribe injection because you think oral medicines have lower quality and efficacy	4 (25%)	3	1
Do you prescribe injection to please patient and guarantee his next visit to your office	4 (25%)	3	1
Do you prescribe injection for its economical benefits	3 (19%)	1	2
Do you believe improper university training is a major cause of prescribing injectables	3 (19%)	1	2

Table 3: Opinion of high rate physicians on effective interventions to improve irrational use of injectables (n = 16)

Question	Frequency of suggestions	Distribution of responses based on physician's gender	
		Male	Female
Patient education about possible adverse effects of injectables	9 (56%)	3	6
Training physicians and medical students	5 (31%)	2	3
Improving quality of oral dosage forms	4 (25%)	3	1
Restriction on prescription of injectables	2 (13%)	1	1
patient education on efficacy of oral dosage forms	2 (13%)	1	1

Table 4: Reasons for prescribing injectable medicines by low rate physicians (n = 13)

Question	No. of yes responses	Distribution of responses based on physician's gender	
		Male	Female
Do you think patient's belief has major impact on your prescribing habit	7 (54%)	1	6
Do you prescribe injection to ensure patient's compliance	5 (38%)	2	3
Do you prescribe injection to satisfy patient's request for faster treatment	4 (31%)	0	4
Do you prescribe injection because you think oral medicines have lower quality and efficacy	4 (31%)	0	4
Do you prescribe injection to please patient and guarantee his next visit to your office	0	0	0
Do you prescribe injection for its economical benefits	0	0	0
Do you believe improper university training is a major cause of prescribing injectables	0	0	0

impact on their prescribing habit. They declare that they prescribe injections because it may provide better compliance or because oral dosage forms may not have sufficient quality. Suggestions from low rate group for effective interventions to improve situation are shown in Table 5. This group strongly believes that patients' education including youngsters about disadvantages of injections would greatly improve the situation. They believe proper training of medical professionals and improving

Table 5: Opinion of low rate physicians on effective interventions to improve irrational use of injectables (n = 13)

Question	Frequency of suggestions	Distribution of responses based on physician's gender	
		Male	Female
Patient education including school children about possible adverse effects of injectables	11 (85%)	1	10
Improving physician's income	4 (31%)	1	3
Training physicians, pharmacists and medical students	4 (31%)	0	4
Auditing prescription habit of physician and provide feedback to them	2 (15%)	0	2
Improving quality of oral dosage forms	2 (15%)	2	0

income are two major contributory factors on improving prescription behaviour of physicians. They also proposed managerial interventions such as auditing physicians' prescribing pattern as an effective interventional tool.

Low rate group also stated following as major disadvantages of injectable medicines:

- Higher price of injectables
- Low compliance by some patients
- Higher risk of adverse effects
- Needs to specific training and equipments for safe injection practice

Discussion

In many developing countries health workers are confronted with patients who prefer injections to oral medicines. The historical background of this popularity may be due to efficacy of these dosage forms to cure disease such as infectious disease. However, economic factors may also determine their widespread use in developing countries. The unnecessary and overuse of injections has created increasing concern among national and international health agencies. From a health prospective, administering injections without adequate medical knowledge or proper sterilization procedure leads to the risk of transmitting viral and/or microbial infections. From an economic point of view the nonessential use of injections imposes an unnecessary burden on patient and national health budgets.

In different cultures the belief in injections as a very powerful method of restoring or maintaining health is shared by some of the providers and patients and it seems it cannot be solved by training alone. Knowledge of the potential risks of injections is often not put into practice. Patient's demand may also force providers administer more injections to please the patient (Reeler, 1990).

Of course in designing effective interventions it has to be borne in mind that some injections are very useful. Vaccination, for example, has saved the lives of many children. In some cases the injection of some antiinfectives may be the most rational way to treat certain conditions. If patients cannot swallow or are nauseated injections may be the best form of treatment. However, most injections given in developing countries are medically unjustified and may be even dangerous. Therefore, it is necessary to prevent and limit the administration of harmful and unnecessary injections without damaging public perception of useful injections. Although providers commonly emphasise patient's demand as a major driver of injection overuse, studies indicate that patients are open to alternative to injections (Hutin *et al*., 2003). Prescribers overestimate patients' preference for injections and have false perceptions about their effectiveness. Prescribers' attitude also contributes to overuse of injections.

In this study 29 general practitioners working in public health care centres were interviewed for their attitude toward injections. According to extent of prescribing injections, physicians were categorized as high rate prescriber and low rate prescriber. Their responses to questions are summarized in Table 2-5. Eighty one percent of high rate prescribers and 54% of low rate prescribers believe patient's demand is the major factor on driving them toward prescription of injections. This indicates that perception of prescribers toward patient's demand is a main driving force on their prescribing habit and they do not rely on their medical knowledge about injections and their proper application. Equal percent (31%) of high and low rate prescribers prescribe injections to respond to patient's request for faster treatment. Both groups believe the lower quality and efficacy of oral dosage forms compared to injections is a driving force for prescribing injections. Although previous studies reported economic benefits as an incentive for providers to prescribe more injection (WHO, 1996), physicians who work in health centres in Iran earn a fix salary and their income is independent of their prescription behaviour. Therefore they should not have any economic incentive to prescribe injections. Only 19% of the high rate prescribers declared financial incentives as an important factor for prescribing injections when they practice in private office. In contrary to low rate prescribers, 19% of high rate prescriber think improper university training is a factor on prescribing injections.

Results of this study clearly show that there is a substantial influence from gender on prescribing pattern. Although most of female physicians interviewed fell in low rate prescriber group, it seems that male doctors in low rate prescribers are more restricted on rational prescribing of injections (Table 2 and 4, gender distribution). Results in Table 2-5 also show substantial influences from gender of prescribers on their attitude toward causes of irrational prescribing of injections. Therefore, it is suggested that corrective interventions might provide different results in different genders and in order to maximize effectiveness of interventions they should be tailored according to gender of prescribers.

Physicians' suggestions on effective interventions to improve rational prescribing of injections are summarized in Table 3 and 5. Both groups believe patients' education is the most effective way of improving situation. This is mainly to the fact that prescribers believe patients' demand is the major driving factor on prescribing injections (Reeler, 1990). However, it seems that low rate prescribers put more emphasise on this intervention.

The fact that both groups believe improving quality of oral dosage forms may improve rational use of injections indicates that attitude of the prescribers toward efficacy of the oral dosage forms should be improved. Since most of countries use same regulatory system for controlling quality of different dosage forms of the medicines, with exception of their inherent differences, it is unlikely that quality of injections would have superior quality.

When prescribers in both groups asked about their opinion on disadvantages of injections surprisingly both groups stated very similar items including higher adverse effects, higher costs and needs for extra trained staff and equipments for administration. This clearly indicates that both groups are aware of disadvantages of irrational prescribing of injection. However, it seems they do not put their knowledge into practice.

Although prescribers indicated educating of patients and training prescribers influences rational use of injections both groups suggested some managerial interventions such as restrictions on prescription of injections and auditing prescription pattern as useful tools for overcoming the problem. This emphasizes importance of implementing multi factorial interventions as effective corrective measures for irrational drug use (Laing *et al*., 2001).

Results of this study show that despite some common reasons for prescribing injections among prescribers, their attitude toward injections clearly differ. Therefore this should be in mind that before

implementing any interventions to improve injections use attitude of prescribers should be investigated and the interventions should be tailored accordingly.

References

Anonymous, 2004. 2nd International Congress on Improving Use of Medicine (ICIUM), Final Recommendations, Chiang Mai, Thailand.

Bhattarai, M.D. and S. Wittet, 2000. Perceptions about injections and private sector injection practices in central Nepal, General welfare pratisthan gates children's vaccine program at PATH, pp: 1-35.

Brokensha, G., 1999. The hollow needle: inappropriate injection in practice, Australian. Prescriber, 22: 145-147.

Cheraghali, A.M., 2003. Rational Drug Use Promoting Activities in Iran: A Successful Trend, Essential Drug Monitor, 33: 10-11.

Cheraghali, A.M., S. Nikfar, Y. Behmanesh, V. Rahimi, F. Habibipour, R. Tirdad, A. Asadi and A. Bahrami, 2004. Evaluation of availability, accessibility and prescribing pattern of medicines in the Islamic Republic of Iran. Eastern Mediterranean Health J., 10: 406-415.

Hutin, VJ., A. Hauri and G.L. Armstrong, 2003. Use of injections in healthcare settings worldwide, 2000: Literature review and regional estimates, BMJ., 327: 1-5.

Laing, R.O., H.V. Hogerzeil and D. Ross-Degnan, 2001. Ten recommendations to improve use of medicines in developing countries, Health Policy and Planning, 16: 13-20.

Montaseri, H., F. Jamei, K. Khairollahi and A.M. Cheraghali, 2005. Particulate Contamination in Single-Dose Parenteral Antibiotics in Iran. Iranian J. Pharm. Sci., 1: 3-8.

Reeler, A.V., 1990. Injections: A fatal attraction? Soc. Sci. Med., 31: 1119-25.

Reeler, A.V., 2000. Anthropological perspectives on injections: A review. Bull. World Health Org., 78: 136-143.

Shalviri, G., M. Cheraghali, K.H. Gholami, E. Kamali and N.Z. Daryabari, 2004. The dilemma of Diclofenac Injection for the Iranian health system. 2nd International Congress on Improving Use of Medicine (ICIUM), Chiang Mai, Thailand.

WHO/DAP/94.18 , 1994a. Injection use and practices in Uganda.

WHO/DAP/94.8. , 1994b. Injection practices in the world, a case study of Thailand.

WHO/DAP/96.4. , 1996. Injection practices in the developing world, A comparative review of field studies in Uganda and Indonesia.