Assessment of injection practice in primary health care facilities of Shiraz, Iran

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Background: Occupational risk for several bloodborne viruses is attributable to unsafe injection practices. To understand injection frequency and safety, we surveyed injection rates and factors influencing injection prescription in primary health care facilities and associated health clinics in Shiraz, Iran.

Methods: We used both quantitative and qualitative approaches to study the frequency and safety of injections delivered in 27 primary health care facilities. We used observations and 3 data collecting tools. Patterns of 600 general practice physicians' (GPs) prescriptions were also reviewed. In-depth interviews to elicit the factors contributing to injection prescriptions were conducted.

Results: The annual per capita injection rate was 3.12. Corticosteroids were prescribed more frequently than antibiotics ($P < .001$). Knowledge of participants concerning transmission risks for 3 of the most common bloodborne infections (BBIs) was less than 75%. Factors affecting use of injections by GPs included strong patient preference for injections over oral medications and financial benefit for GPs, especially those in private practice settings.

Conclusion: Frequency of therapeutic injections in the participating facilities in Shiraz was high. Sociocultural factors in the patient community and their beliefs in the effectiveness of injections exerted influence on GP prescribing practices. Programs for appropriate and safe injection practices should target GP and injection providers, as well as patients, informing them about alternative treatments and possible complications of unnecessary and unsafe injections.

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Bangladesh has both high levels of injection use and unsafe injection practices, whereas 77% of injecting practices observed in India were deemed unsafe. In Swaziland, all observed settings were reported to use disposable syringes. However, syringes and needles were reused, and recapping needles was a common practice. All HCWs interviewed in India correctly identified that unsafe injections could transmit HIV, 71% indicated that HBV could be transmitted, and none identified unsafe injection practices as being able to transmit HCV.

In China, injections were common, and HCWs there understood that unsafe injection practices were associated with the transmission of BBVs. Most HCWs in China correctly identified that unsafe injecting practices were associated with HIV and HBV transmission (95% and 89%, respectively), whereas 59% did not recognize HCV as a potential risk.

Knowledge and attitudes concerning injection safety held by HCWs in Nigeria correlated positively with the years of clinical experience. Nurses in Nigeria who had more than 10 years of experience when compared with other professional groups of equivalent experience were found to be better trained and demonstrate greater knowledge and have positive attitudes toward safe injection practices.

A qualitative study carried out in northern rural India reported the practice of reusing syringes, especially during tuberculosis (BCG) vaccination, and when multidose vials were used because of the desire to preserve the vaccine that remained in the death space of used syringes for further use. Currently, no similar reports have been generated in Iran. Therefore, we studied the frequency and safety of injection practices and examined factors affecting injectable prescription patterns of physicians practicing in primary health care facilities in Shiraz.

METHODS

Both qualitative and quantitative methodologies were used to explore injection practices and beliefs to achieve data triangulation. The study was undertaken in 2012.

Participant source

A cross-sectional survey was undertaken in all 27 urban primary health care facilities in Shiraz, which is located in the Fars province in southwestern Iran. Shiraz has a population of over 1,500,000 inhabitants. All primary health care facilities have clinics for the provision of immunization and contraceptive injections. Both types of facilities, including government and private providers, were surveyed. One GP, 1 injection provider (nurse practitioner), and 3 to 4 patients in each facility participated. The total participants included 27 GPs, 27 injection providers (nurse practitioners), and 100 patients. If more than 1 GP or injection provider was present, a participant was randomly selected. All participants worked at their facility for at least 6 months. Patients were selected at random in the waiting room reserved for creating groups. When a patient was < 15 years of age, the parent was interviewed.

An oral informed consent was obtained from each participant prior to starting. The study was approved by the Ethical Committee of Shiraz University of Medical Sciences. SPSS version 15 (SPSS Inc., Chicago, IL) was used for data management and analysis and z was set at the 5% level.

Study 1: WHO OT8 values

We randomly selected 30 prescriptions from each of 20 randomly selected GPs for review (600 prescriptions). Randomization involved selection of specific weeks and days within these weeks. For a day to be included, there had to be at least 30 prescriptions written. If the number was less, then subsequent days were chosen to review until the desired day with 30 prescriptions was achieved. The data were examined to establish the WHO OT8 value (the number of prescriptions with at least 1 injection divided by the total amount of prescription lists surveyed).

Study 2: Injection practices using quantitative and qualitative methodology

We used the rapid assessment and response guide developed by WHO, which includes sample size calculation, 2 guides for prescribers and injection providers, a guide for interviewing patient populations, and a checklist for observation. We used a semi-structured, self-administered data collecting form for the GPs and injection providers. A semi-structured interview was performed by a trained interviewer, and a trained observer collected information on the injection process (whether the injection was therapeutic or immunization) using a preset list of actions and topics, while observing the process.

We used the WHO Tool to investigate GP therapeutic rationale and other motives for prescribing injections as well as observing the work environment, which may influence prescribing patterns for injectable drugs. The GPs participating in quantitative sessions were invited to participate in qualitative study. It was not possible to do focus group discussions because of the broad geographic dispersion of the centers and a lack of free time indicated by GPs. Instead, the GPs were interviewed and asked open-ended questions provided by the WHO Tool. The in-depth interviews were conducted by 1 interviewer, who advised the participants that interviews would be recording without using identifiers. For GPs who did not give permission for audio recordings, a note taker wrote responses verbatim. Interviews lasted on average 30 to 45 minutes. Interviews were transcribed immediately and coded for primary and secondary themes. Data coding was checked by colleagues for agreement or to extract new themes. To increase credibility, extracted open codes and themes were member checked by 2 participating GPs. GP interviews continued until the data collected was considered to be saturated because no new additional themes or information were identified.

RESULTS

There were no significant differences in age (P = .341) or years of experience (P = .473) between GPs and injection providers (Table 1). There were more female injection providers than males (P < .001). The rate per capita of self-reported injections per year was 3.12 among the 100 patients interviewed. The OT8 estimate for prescription written at the 27 primary care facilities was 47% (284/600). Review of these prescriptions identified corticosteroids (53%, 151/284) as the most common injectable medication followed by antibiotics (46%, 130/284). Other injection types were antiemetic and vitamins.

When asked, GPs believed the most common prescriptions for injections were for antibiotics (78%), corticosteroids (48%), and
analgesics (30%). GPs believed antibiotics injections were commonly prescribed for pharyngitis and the common cold, whereas corticosteroids were used for pain management (such as joint and back pain) or generalized weakness.

Documented median number of daily prescribed therapeutic injections was 7.5, whereas GPs self-reported a median of 2.0. Patient and GP preferred route of treatment for fever and/or sore throat were similar ($P = .39$) (Table 2). The median number of documented immunization injections per day was 20.0.

Observations in all 27 health care facilities identified that injections involved sterile syringes and needles, which were not opened until immediately prior to use. All injection providers reported using only new single-use syringes and needles. The proportion of observations identified that 7% (2/27) involved disposable injection equipment for immunization; 11% (3/27) did not dispose immunization equipment correctly; and 37% (10/27), when observed, performed hand hygiene prior to injection. Two-handed recapping of syringes was observed in 22% (6/27) of injection providers, and 81% (22/27) discarded used needles and syringes appropriately in impermeable plastic safety boxes near the point of care.

Of the 27 injection providers interviewed, 37% (10/27) reported to have sustained a needlestick injury (NSI) in the past year. Mean days for collecting safety boxes by waste handlers was every 7.00 ± 3.96 days. Four injection providers indicated a shortage of safety boxes (sharps containers) in their facility. All but 1 injection provider had completed a HBV vaccination series. The 3 BBIs were correctly identified as a risk associated with contaminated injection equipment by 70% of GPs and injection providers. Just over half (57%) of patients reported 3 BBIs as risk associated with contaminated injections (Fig 1). Total of 8 in-depth interviews was performed, and 2 final themes were extracted by analysis of qualitative data: (1) pressure from patients for injections and (2) financial benefits especially in the private clinics.

Pressure from patients for injections

This theme consisted of 2 subthemes: incorrect patient beliefs and problems identified by patients. Some GPs mentioned that there are erroneous beliefs concerning injections present in the general population. GP number 4 during an interview stated the following: "They say our body has adapted to penicillin. . . . patients want all diseases to be cured by penicillin." GP number 8 said the following: "Some patients believe in injections, and say . . . if I don’t have it, I will not be cured."

GPs also indicated that some patients do not adhere well to oral medication regimens, often forgetting to take their medication. As GP number 2 said, "They say that by receiving injection, I no longer need to take oral medications; there is no need for oral medications." GP number 8 stated, "Some patients say I cannot give my baby medications, on time." GP number 5 reported the following: "Some patients say I would forget to eat [take my] medications."

Patients believe that injections are quicker and more effective than oral medications, often forgetting to take their medication. As GP number 5 said, "I have lots of patients [who] say injection works faster and has more effect."

This theme has 2 subthemes: GP popularity and financial motives. As GP number 5 said, "Physicians which prescribe more injections are more popular in patients’ view." In addition, GP number 8 said, "I had a patient say to me . . . if you do not prescribe injection for me, I would get my money back!"

During interviews, participants pointed to a need to inform the population about complications associated with injections, identifying solutions for overprescribing medications. GP number 2 said, " . . . We should have fewer advertisements [about medications]. Because television is in front of their [patients’] eyes and they watch it usually, it [TV] is more effective [than education from a GP]. Television has too much credibility among people."

DISCUSSION

A WHO review of developing and transitional countries indicated overuse of injections in primary health care facilities located in Shiraz.12,13 Our estimated annual per capita injection rate in Shiraz was 3.12, which agrees concurs with the WHO review.

The WHO prefers oral routes for medications, unless patients cannot take oral medication or where symptoms or diagnosis warrant injection.1 A lower per capita rate of 0.2 existed in Gujarat.6 In this study, the number of immunization injections was greater than that of therapeutic injections. This ratio was higher in primary clinics outside of Shiraz.18 However, the Shiraz primary care GPs underestimated their use of injectable medications by 73%. The estimated OT8 for Shiraz was high at 47.3%, which is similar to that of North India at 55.5%15 and Bangladesh at 32.8%6.

Studying prescription patterns revealed that the use of injectable corticosteroids was more frequent than that of injectable antibiotics. A Bangladesh study reported that the most prescribed injectable medications were antibiotics, intravenous fluids, and analgesics, respectively.6 This is probably due to the types of diseases treated by GPs in primary health care facilities. However, the most prescribed injectable drugs “reported” by GPs were
antibiotics. The difference between the most prevalent prescribed injectable medications (corticosteroids) documented in the notes and the most prevalent prescribed medications (antibiotics) reported to by GPs may be due to GPs’ increased concern regarding antibiotic resistance or perhaps due to deflecting their incorrect beliefs regarding positive effects of corticosteroid use. GPs must become more aware of the consequences of corticosteroids over-use. Strict control measures could lead to a decline in the over-prescription of corticosteroids as well as antibiotics.

GPs indicated the most common use for injections was to treat pharyngitis, relief of pain, and nonspecific conditions, such as generalized weakness. A study in India revealed fever, lower respiratory infections, and minor injuries as the 3 most common conditions requiring injections. It appears that many injections are unnecessary.

Patient preference for a treatment of a sore throat was 3 times greater than that for fever. The need to use injections to treat fever did not differ between patients and GPs. The preference of patients for injections to treat some conditions, such as sore throat, was revealed by in-depth interviews with GPs as a subtheme of incorrect beliefs of patient.

The risk associated with NSI increases with greater frequency of handling contaminated needles and syringes. Increased awareness of this issue and targeting GPs with a prescribing program that redressed the practice of injections as a preferred route of administering antibiotics could also reduce the risk of NSI and the cost of health care.

The patient community appears to need information concerning antibiotic administration; GPs reported that their patients held a belief that the therapeutic effect of injections was superior to oral medications. This is commonly held belief. Approximately one-third of Ethiopian patients when interviewed believed that injections work more quickly and are more effective than oral medications. The majority of Pakistani patients interviewed believed that injections are faster acting than oral medications. This cross-cultural phenomenon supports GPs who reported that their patients’ insisted on injection treatments. Acquiescing to such requests appears to increase a physician’s popularity resulting in repeat visits and financial benefit.

Patients need to be informed about alternative treatments and possible complications of unnecessary and unsafe injections. GP interviews indicated the need for an extensive patient education program involving public media and face-to-face instruction. Interventions with the aim of decreasing use of injections require increased health literacy of the general population as well as considering sociocultural factors. For example, because immunizations comprise the bulk of injections at primary care facilities, efforts to reduce injection use should be carefully directed. Unnecessary injections must be avoided, whereas immunizations should still be encouraged in developing countries.

Observations in all facilities indicated the universal use of single-use, disposable syringes and needles for injections. These findings correlate with studies conducted in Ethiopia, India, Swaziland, and Mongolia. Use of single-use injection equipment syringes and needles may be due to adequate availability.

The number of NSI per injection provider in Shiraz was 37%, which is lower than a previous study conducted in the same province. In that study, 50% of hospital-based nurses recalled a NSI incident. This higher reported NSI probably is due to types of patients treated and the manner in which treatment is afforded in hospitals as compared with primary health care facilities.

NSI in primary health care facilities results in increased costs associated with laboratory follow-up and prophylaxis. Decreases in NSI rates could be achieved by performing fewer injections and cessation of 2-handed recapping of needles. Results from this study indicated that 2-handed recapping occurred in 22% of injections given and that there was a paucity of safety box provision.

Injection providers appear to need additional training to heighten awareness that unsafe injection practices increase the chances of occupationally acquired and nosocomial infections. Special attention needs to be directed toward appropriate disposal of used needle and syringes into safety boxes and performing proper hand hygiene. In addition, HBV immunization is an appropriate preventive method for providers of injections. In this study, GP knowledge of the risks of BBI transmission associated with injections was lower than other involving lower resource counties but similar to our patient populations. GPs often listed other diseases (eg, skin infection and abscesses) than the 3 BBSs as prime injection-related risks. This suggests that our injection providers and GPs may require additional continuing education. Because our study focused on primary health care facilities in an urban community of Shiraz, our findings and conclusions may not be representative of other health care settings including hospitals, private practices, and primary health care facilities in rural areas of Iran.

CONCLUSION

The frequency of injections in primary health care facilities in Shiraz is relatively high. In addition, unsafe injection practices were noted. There appears to be a need for programs covering appropriate and safe injection practices. These should involve the GPs, the injection providers, and the general population.

GPs should consider prescribing fewer unnecessary injections, and injection providers should all receive HBV vaccination. The general population must become more aware of the consequences of unnecessary and unsafe injections.

Strategies for reduction of number of injections should be carefully implemented to avoid decrease of necessary injections. Sociocultural factors in the patient community and their beliefs of the effectiveness of injections did exert influence on GP prescribing practice.

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References


