

Injection Overuse

Farideh Shiva^{1,*}

¹ Pediatric Infections Research Center, Shahid Beheshti University of Medical Sciences, Tehran, IR Iran

*Corresponding author: Farideh Shiva, Pediatric Infections Research Center, Shahid Beheshti University of Medical Sciences, Tehran, IR Iran. Tel: +98-9126789986, E-mail: faridehshiva@gmail.com.

Received: August 17, 2013; **Accepted:** August 28, 2013

Keywords: Infections; Hazards; Medicine

Injections have been used for delivery of essential, non-essential and even harmful substances into the human body for centuries, but since the innovation of the glass syringe in the early nineteenth century, which made it possible to accurately quantify the prescribed dose, injection has been considered as the most reliable method for administration of medication (1). Injected medicines are deemed to be absorbed more rapidly and to be more effective than those given through other routes. Added to this is the common belief by physicians that all patients prefer injections to the oral route (1, 2). These misconceptions have resulted in gross overuse of injections with the result that approximately 16 billion injections are given every year, mostly in developing and transitional countries, 95% for therapeutic purposes and only 3% for immunization. According to the figures given by the World Health Organization (WHO) over 70% of injections are unnecessary as the prescribed medications are either not indicated or would be easily absorbed by the oral route (2, 3). Most common medications prescribed via injections are antibiotics and intravenous fluids, followed by analgesics. In a report from Iran, in which 500 outpatient prescriptions for acute respiratory tract infections and acute gastroenteritis in immune-competent children were reviewed, 79.4% had been prescribed antibiotics and 42.8% had been given injections (4). In a survey conducted on 500 individuals in the general community in Cambodia at least 40% of the population had received ≥ 1 injection during the past 6 months, of which 74% were therapeutic injections (5). Use of unnecessary injections has also been reported in young infants with minor illnesses like viral respiratory tract infections (6). Similar figures about injection overuse, that reveal a digression from rational medical practice, have been reported from various parts of the developing world (1, 7, 8).

It has been estimated that every year unsafe injections

account for 1.3 million early deaths, cost 26 million years of life, and procure a huge annual burden in medical expenses (2).

The 3 most common blood borne infections attributable to injections and/or needle stick injuries are *Hepatitis B* (HBV), *Hepatitis C* (HCV), and the *Human Immunodeficiency Virus* (HIV) (2, 5, 7). According to a global report published in 2010, medical injections have caused approximately 15 million HBV, 1 million HCV, 340,000 HIV and 3 million bacterial infections, accounting for 25% of HBV, 14% of HIV and 8% of HCV infections, as well as over half a million injection site abscesses in 2008 (9). These figures have not taken into account the infections caused in drug abusers and unreported cases.

Besides causing unnecessary pain and increasing medical expenses, injections are associated with needle stick injuries, (NSI), in both health care recipients and health-care workers. Studies from different parts of the world quote widely varying figures. About 76% of residents in training in Indian hospitals and 71% of medical and nursing students at Shiraz university hospitals had sustained NSI, while 55% of physicians and about 19% of pediatric healthcare workers in Germany had been exposed to potentially infected blood through needle stick injuries (10-12). Exposure to blood borne viruses through needle-stick injuries has been estimated to cause 39% of HCV, 37% of HBV, and 4.4% of HIV infections in healthcare workers (13). HBV, HCV and HIV are infections that lead to chronic disease, morbidity and mortality resulting in escalating economic expenditure and human misery. Studies have shown that the majority of NSIs to health workers are incurred because of high-risk behaviors like trying to separate the needle from the syringe and recapping the needle after use (1, 4).

Traumatic neuropathy resulting in flaccid paralysis has also been reported in children receiving needless injec-

Implication for health policy/practice/research/medical education:

This article highlights the hazards of injections and suggests ways to decrease the use of unnecessary injections in medical practice.

Copyright © 2014, Pediatric Infections Research Center. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

tions (14). Intramuscular injections in inappropriate sites like the gluteal region have been associated with permanent damage to the sciatic nerve, paralysis of the muscles of the lower limb and foot drop (15).

In order to promote rational and safe injection practices the WHO has propagated a program named as safe injection global network, (SIGN) that provides clear guidance on the use of 'safe injections'; A safe injection is one that "does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for the community" (16).

Unsafe injection practices, on the other hand, include prescribing unnecessary injections, evading proper hand washing, reusing syringes, utilizing single dose vials for more than one patient, recapping needles and inappropriate disposal of equipment used for injections.

One of the main recommendations put forward in the Annual SIGN meeting in 2010 was to "develop an action plan to reduce unsafe injection practices worldwide by 50% by 2015". This strategy was labeled as an "ongoing activity and the overall objective of the meeting" (9).

To cite some common examples of situations where injections are not needed in pediatric care: most cases of dehydration after acute gastroenteritis can be managed with oral rehydration therapy (ORT) and should not receive intravenous fluids; most respiratory tract infections in children are viral and do not need antibiotics or any injections; oral steroids are as effective as injections of methylprednisolone for acute episodes of asthma, and vitamins, iron or other micro-nutrients, if indicated, are all effective as oral formulations.

A multi-faceted approach is required to decrease the hazards of needless injections. Firstly, to reduce the number of injections, i.e. injections should only be given when absolutely necessary and secondly, to reduce harm from necessary injections. Health care providers need to understand that in most patients, especially children, non-invasive routes of administering medications are as effective as the injectable form. Furthermore, contrary to popular belief, most children and their caretakers prefer a non-invasive route to injections. In addition, media may be utilized to propagate information about the rational use of medications to the general public. To reduce harm, all health personnel should be vaccinated against HBV, receive appropriate training in preventing exposure to contaminated equipment and should be well-informed about post-exposure prophylaxis. Additionally, all health care centers should have an action plan for reducing the use of injections, promoting safe injection practices

and providing the needed equipment for preventing sharps injury.

Financial Disclosure

No funding was provided by any organization.

References

1. Kotwal A. Innovation, diffusion and safety of a medical technology: a review of the literature on injection practices. *Soc Sci Med*. 2005;**60**(5):1133-47.
2. World Health Organization. WHO injection safety fact sheet No. 231, Revised October 2006. Available from: <http://www.who.int/mediacentre/factsheets/fs231/en/>.
3. Bodenschatz C, Talaat M, Kandeel A, Lohiniva AL, Radwan E, Mahoney F. Injection prescribing patterns in public health care facilities in Egypt. *East Mediterr Health J*. 2009;**15**(6):1440-8.
4. Shiva F, Eidikhani A, Padyab M. Prescription practices in acute pediatric infections. *J Pediatr Infect Dis*. 2006;**1**:25-8.
5. Vong S, Perz JF, Sok S, Som S, Goldstein S, Hutin Y, et al. Rapid assessment of injection practices in Cambodia, 2002. *BMC Public Health*. 2005;**5**:56.
6. Gunasekaran D, Adhisivam B, Arulkumaran A, Shanthi AK. Intramuscular injection practices among infants. *Indian Pediatr*. 2007;**44**(11):842-4.
7. Shill MC, Fahad MB, Sarker S, Dev S, Rufaka HK, D AK. Injection practices at primary healthcare units in bangladesh: experience at six upazilla health complexes. *Australas Med J*. 2011;**4**(1):26-42.
8. Farsi D, Zare MA, Hassani SA, Abbasi S, Emaminaini A, Hafez-moghadam P, et al. Prevalence of occupational exposure to blood and body secretions and its related effective factors among health care workers of three Emergency Departments in Tehran. *J Res Med Sci*. 2012;**17**(7):656-61.
9. Report of the SIGN 2010 meeting. Available from: http://www.who.int/entity/injection_safety/toolbox/sign2010_meeting.pdf.
10. Rele M, Mathur M, Turbadkar D. Risk of needle stick injuries in health care workers - a report. *Indian J Med Microbiol*. 2002;**20**(4):206-7.
11. Wicker S, Jung J, Allwinn R, Gottschalk R, Rabenau HF. Prevalence and prevention of needlestick injuries among health care workers in a German university hospital. *Int Arch Occup Environ Health*. 2008;**81**(3):347-54.
12. Askarian M, Malekmakan L. The prevalence of needle stick injuries in medical, dental, nursing and midwifery students at the university teaching hospitals of Shiraz, Iran. *Indian J Med Sci*. 2006;**60**(6):227-32.
13. Pruss-Ustin A, Rapiti E, Hutin U. Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. Protection of the Human Environment, World Health Organization, Switzerland. Safe Injection Global Network Secretariat. 2013; Available from: http://www.who.int/quantifying_ehimpacts/global/7sharps.pdf.
14. Mansoor F, Hamid S, Mir T, Abdul Hafiz R, Mounts A. Incidence of traumatic injection neuropathy among children in Pakistan. *East Mediterr Health J*. 2005;**11**(4):798-804.
15. Mishra P, Stringer MD. Sciatic nerve injury from intramuscular injection: a persistent and global problem. *Int J Clin Pract*. 2010;**64**(11):1573-9.
16. The SIGN Alliance. World Health Organization. Available from: http://www.who.int/injection_safety/sign/en/.