

# An Important Environmental Risk from Patients with Diabetes using Insulin: Disposal of Medical Waste



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## Introduction

Diabetes mellitus is an escalating global epidemic [1]. In 2015, there were 415 million diabetics in the world it is expected that by 2040 this figure will raise to 642 million [2]. Self-care is crucial for controlling diabetes and maintaining blood glucose at target values. This involves self administration of insulin and/or selfmonitoring of blood glucose (SMBG) [3]. The management of diabetes necessitates frequent assessment of blood sugar levels and the use of oral medications and insulin injections [4]. Insulin is indispensable to the management of DM. Correct insulin injection techniques are essential for better diabetic control [5,6].

Previous research on insulin injection techniques have addressed the importance of insulin pen education, injection techniques, but very little research has been referred the disposal of medical wastes [7]. Proper disposal of sharps is one of the crucial, but often neglected components of proper injection techniques [3]. Incorrect sharp disposal practices among diabetes patients lead to the accumulation of sharps within the household and their improper disposal can potentially result in public health problems, such as personal injury of people in the general community and the propagation of blood borne infections via needle stick injuries [4]. The lancets used for SMBG are often loosely recapped and are vulnerable to breakage/detachment when subjected to even the slightest of force [3].

Similarly, failure to use puncture proof containers for discarded lancets and insulin syringes is equally hazardous. Needlestick injuries may lead to epidemics of blood-borne infections such as HIV/AIDS, hepatitis B and hepatitis C. According to the Centre for Disease Control, Atlanta, outbreaks of hepatitis B due to improper blood glucose monitoring practices have already been reported in home and assisted living care settings [8]. The disposal of sharps generated in the community has been identified as an area of public health and environmental health

concern. While there is a wealth of literature on sharps disposal practices in healthcare settings, the sharps disposal practices of diabetic patients living at home have been poorly documented [9]. Studies throughout the world have demonstrated that diabetics inappropriately discard medical medical wastes.

In a Nepal study, the most common methods used to dispose of used needles were transferring them into municipal waste disposal vehicles, throwing them in isolated places, and burning them [5]. The Coalition for Safe Community Needle Disposal estimates from data it has collected that there are over 7.5 billion syringes used in households yearly, and the numbers are increasing. Individuals with diabetes constitute the largest user group; however, this number does not reflect the number of lancets used by 25 million diabetics. Moreover, according to the insulin pump management consensus statement released by the American Association of Clinical Endocrinologists, insulin pumps are used by approximately 375,000 Americans. There are approximately 26 million Americans with diabetes, and it is estimated that about 26% (6.5 million Americans) receive 1-4 insulin injections per day. This means that collectively over 13 million needles and syringes are being used per day. This enormous figure highlights the importance of researching the impact on the environment of needles, syringes, and lancets generated by this population [10].

Supporting the conclusions of previous research, in a study of disposal practices conducted in Southern Ghana, Udofia et al. [11] found that the majority of unwanted medicines and sharps are discarded in ordinary household garbage. In a study conducted by Govender and Ross in South Africa (2012), it was found that more than 97% of patients discarded their sharps inappropriately [12]. Similarly, most Indian patients throw their used needles and syringes directly into the garbage and public drainage system [13]. Other studies also report improper disposal

of used needles [6,7]. A study conducted in Pakistan showed that the majority of the diabetics in Pakistan use syringes (88.3%) for insulin administration. Most patients disposed of used devices (syringes, 92%; pens, 75%; and lancets, 91%) along with other household waste into the same garbage collection bin. This is a very common practice among insulin users in Pakistan [14]. The studies in Turkey showed that patients with diabetes disposed of their used insulin needle tips inappropriately [15,16].

### Conclusion

Studies highlight that needle disposal is a global problem in both the developed and developing world. No recent studies were found on safe disposal of sharps by diabetic patients. Healthcare professionals also should educate patients and their relatives about the correct use of insulin pens during their first visit and subsequent follow-ups. They can play a significant role in the safe and effective use of insulin pens in diabetic patients. However, there still remains a need for the development of uniform national guidelines on the disposal of sharps for diabetic patients living at home.

### References

1. (2018) Improving care and promoting health in populations: standards of medical care in diabetes-2018. American Diabetes Association 41(Suppl 1): S7-S12.
2. IDF Diabetes Atlas (2015) International Diabetes Federation. (7<sup>th</sup> edn), USA.
3. Majumdar A, Sahoo J, Roy G, Kamalanathan S (2015) Improper sharp disposal practices among diabetes patients in home care settings: Need for concern? *Indian J Endocrinol Metab* 19(3): 420-425.
4. Atukorala KR, Sumanasekera RD, Wickramasinghe KH, Wickramasinghe SI (2016) Practices related to sharps disposal among ambulatory patients with diabetes on insulin therapy. *The Ceylon Medical Journal* 61(2): 91.
5. Poudel RS, Shrestha S, Piryani RM, Basyal B, Kaucha K, et al. (2017) Assessment of insulin injection practice among diabetes patients in a tertiary healthcare centre in Nepal: a preliminary study. *J Diabetes Res* 2017: 6.
6. Frid AH, Hirsch LJ, Menchior AR, Morel DR, Strauss KW (2016) Worldwide injection technique questionnaire study: population parameters and injection practices. *Mayo Clinic Proceedings* 91(9): 1212-1223.
7. Kalra S, Mithal A, Sahay R, John M, Unnikrishnan AG, et al. (2017) Indian injection technique study: injecting complications, education, and the health care professional. *Diabetes Ther* 8(3): 659-672.
8. Healthcare-Associated Hepatitis B and C Outbreaks ( $\geq 2$  cases) Reported to the centers for Disease Control and Prevention (CDC) 2008-2017.
9. Olowokure B, Duggal H, Armitage L (2003) The disposal of used sharps by diabetic patients living at home. *Int J Environ Health Res* 13(2): 117-123.
10. Kathlin G (2011) Analysis: The impact of needle, syringe, and lancet disposal on the community. *J Diabetes Sci Technol* 5(4): 848-850.
11. Udofia EA, Gulis G, Fobil J (2017) Solid medical waste: a cross sectional study of household disposal practices and reported harm in Southern Ghana. *BMC Public Health* 17(1): 464.
12. Govender D, Ross A (2012) Sharps disposal practices among diabetic patients using insulin. *S Afr Med J* 102(3 Pt 1): 163-164.
13. Patil M, Sahoo J, Kamalanathan S, Selviambigapathy J, Balachandran K, et al. (2017) Assessment of insulin injection techniques among diabetes patients in a tertiary care centre. *Diabetes Metab Syndr Suppl* 1: S53-S56.
14. Ishtiaq O, Qadri AM, Mehar S, Gondal GM, Iqbal T, et al. (2012) Disposal of syringes, needles, and lancets used by diabetic patients in Pakistan. *J Infect Public Health* 5(2): 182-188.
15. Zuhur Yanık Ş, Çakır AD, Kuşkonmaz G, Kutlu L (2014) Assessment of the level of knowledge of the management of medical wastes of type 1 diabetes patients who are receiving insulin" 2. National Health Organizations Environmental Management Symposium. May Istanbul University, Istanbul, Turkey.
16. Kır Biçer E, Güçlüel Y, Pirecioğlu M (2016) Medical waste management in diabetic patients with foot wound: a pilot study in Turkey. National Health Organizations Environmental Management Symposium, oral presentation, Istanbul, Turkey.



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