

Patients Knowledge and Practices about Disposal of Used Insulin Needles in Diabetic patients of a Tertiary Care Hospital

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ABSTRACT

Background: Pakistan is now the 3rd country having highest diabetic population in the world. [1] Many of the diabetics are on insulin. The issue of the safe disposal of insulin syringes is an area of concern.

Aim: To assess the knowledge & disposal practices of insulin needles and its relationship with the different parameters related to diabetes education.

Methods: This cross-sectional study was conducted at the Services Hospital Lahore after approval of institutional review board. 363 diabetic patients, fulfilling the inclusion criteria, were approached. The patients were interviewed through a validated questionnaire. The data was stratified according to the age, gender, duration of diabetes, duration since last instructions reviewed. The chi-square test was applied. Data was analysed using SPSS 22.

Results: Almost all patients 98.6% were (n=359) adult, 4(1.2%) were adolescents i.e., below 18 years of age. Mean age of study population was 49.71±13.36 years, mean weight was 67.12±13.29 kg and mean height was 160.95± 6.89 cm. Among 363 cases, 209(57.6%) were females and 154(42.4%) were males. 242(67.5%) of study population was above age of 45 years while 118(32.5%) was below the age of 45 years. Mean duration of diabetes was 95.18±54.49 months and mean duration of insulin use was 6.45±3.7 years. Among all, 332(91.5%) use syringe for injecting insulin and 31(8.5%) use pen as device for insulin. About 95% of patients discard their insulin waste into home rubbish. Among that 95% of patients who are discarding their insulin waste into household rubbish, 91% discards it after recapping of needles but 4% of them put it into rubbish without recapping. More than three fourth (82.9%) of study participants were not confident about having correct knowledge of waste disposal while small proportion of participants (17.1%) were confident of having correct knowledge.

Conclusion: Unawareness about correct insulin disposal technique is much prevalent and is a major hazard for transmitting infectious diseases accidentally. Risk can be reduced by reinforcing the education.

Keywords: Diabetes Mellitus, Insulin.

INTRODUCTION

Diabetes Mellitus, a metabolic disorder basically characterized by the hyperglycaemia resultant of either due to insulin deficiency or insulin resistance, or combination of both and is an increasing global issue from the past few decades as a result of sedentary lifestyle and less time for exercise^{2,3}. According to the latest statistics by ADA, Pakistan is now ranked 3rd, regarding prevalence of diabetes Mellitus¹. According to the National Diabetic survey of Pakistan 2016, 2017 every fourth Pakistani was suffering from diabetes and this ratio is now increased which is the alarming situation for healthcare system⁴. Diabetes Mellitus is treated by either insulin alone or in combination with oral hypoglycaemic drugs. Insulin was discovered around a century ago by Fredrick Banting and was the first treatment for the management of diabetes mellitus⁵. According to a survey about 27% of American diabetics are using insulin. In Pakistan this ratio is very small as compared to US due to many misconceptions and myths related to insulin injections^{6,7}. Besides the major problems with insulin including risk of hypoglycaemia, lipodystrophy, bleeding at the site of injection and insulin allergy, an important issue related to needle injury which is mostly due to improper disposal of needles and waste material^{8,9}.

There are few studies which have assessed the knowledge and real practices about insulin related waste disposal but local studies are scarce. Due to scarcity of local data this study was planned, the aim of which was to know the usual waste disposal practices among diabetic patients so that local guidelines related to waste disposal be formulated in the light of current problems and understanding of the patients.

MATERIAL & METHODS

This cross-sectional study was conducted at the Services Hospital Lahore from July 1st 2020 to December 31st 2020. 363 diabetic patients who were using insulin and met the inclusion criteria were enrolled in the study after providing written informed consent. Patients were examined and interviewed through a validated Questionnaire. Permission was granted by IRB.

Inclusion criteria

- Patients of any age.
- Either gender.
- Diabetic patients (having any type of diabetes mellitus), taking insulin themselves for more than 6 months.

Exclusion criteria

- Patients taking alternative medicines for diabetes mellitus.
- Patients who need help for injecting insulin.
- Patients not willing to participate.

A sample size of 345 cases was estimated with a confidence level of 95%, a margin of error of 5%, and the predicted percentage of incorrect waste disposal as 66 %. However total of 363 patients were enrolled in the study. Non-probability consecutive sampling was utilized.

Statistical analysis: Data was analysed using SPSS version 22.0. Numerical variables, i.e., age; weight was presented as mean and standard deviation. Qualitative variables such as gender were presented in the form of frequencies and percentages. Data was stratified for age, gender, duration of diabetes, number of injections per day and time since review of instructions. The chi-square test was applied to check statistical significance post-stratification.

RESULTS

Mean age of study population was 49.71±13.36 years, mean weight was 67.12±13.29 kg and mean height was 160.95± 6.89 cm. Among 363 cases, 209(57.6%) were females and 154(42.4%)

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were males. More patients were above age of 45 years (67.5%) while lesser (32.5%) were below the age of 45 years. Mean duration of diabetes was 95.18±54.49 months and mean duration of insulin use was 6.45±3.7 years. About 95% of patients discard their insulin waste into home rubbish.

Table 1: Baseline Parameters

Parameter	Frequency
Gender	
Male	154 (42.4%)
Female	209 (57.6%)
Age	
Less than 45 years	118 (32.5%)
45 years and above	245 (67.5%)
Duration of insulin use	
Up to 5 years	160 (44.1%)
More than 5 years	203(55.9%)
Insulin Device	
Syringe	332 (91.5%)
Pen	31 (8.5%)
No	
History of needle Prick	
Yes	20 (5.5%)
No	343 (94.5%)
Anyone around might get pricked	
Yes	161 (44.4%)
No	202 (55.6%)
Patients confident to know about safe disposal technique of sharps	
Yes	62 (17.1%)
Need more training	301 (82.9%)
How you dispose insulin syringes	
Into a special container	18 (5%)
Into home rubbish with the cap on	331 (91.2)
Into the rubbish without capping	14 (3.8)

Table 2. Cross tabulation of confidence about safe disposal practices with different parameters

Parameter	Need more training	Confident	P value
Age			
Below 45 years	91 (77.1%)	27 (22.9%)	P > 0.05(0.04)
45 years & above	210 (85.7%)	35 (14.3%)	
Gender			
Female	176 (84.2%)	33 (15.8%)	P > 0.05(0.4)
Male	125 (81.2%)	29 (18.8%)	
Duration of Insulin use			
Up to 5 years	133 (83.1%)	27 (16.9%)	P > 0.05(0.9)
More than 5 years	168 (82.8%)	35 (17.2%)	
History of accidental prick			
No	286 (83.4%)	57 (16.6%)	P > 0.05(0.3)
Yes	15 (75%)	5 (25%)	
Educator			
A representative of manufacturer	8 (42.1%)	11 (57.9%)	P < 0.05(0.00)
Diabetes Educator	202 (86.0%)	33 (14%)	
Doctor	91 (83.5%)	18 (16.5%)	
Instructions last reviewed			
Within last 1 year	126 (80.8%)	30 (19.2%)	P < 0.05(0.05)
1 to 5 years	166 (86.9%)	25 (13.1%)	
More than 5 years ago	09 (56.3%)	07 (43.7%)	
Insulin Device			
Pen	21 (67.7%)	10 (32.3%)	P < 0.05(0.19)
Syringe	280 (84.3%)	52 (15.7%)	

DISCUSSION

There are many studies that have assessed the correct insulin injection technique, knowledge about insulin injection practices and issues related to incorrect technique but data regarding assessment of waste disposal and its implications is scarce^{10,11,12}. A study by Jordan M et al found that about three fourth of their participants unsafely dispose the waste including lancets, pens, cartridges and needles into the household rubbish and two third of

their participants reported that they have not properly educated about waste disposal by their healthcare attendants. This was a comparatively smaller data as compared to our study which has almost double the sample size of Jordan et al (150 vs 363) but our study demonstrated that about 95% of participants dispose their insulin related waste into home rubbish¹³.

A Brazilian study by Cunha et al also found very high number of patients (60%) with unsafe disposal of the insulin waste. This was also less than the ratio found in our study. This study also claims that patients who were taught by nurses were having more knowledge about safe disposal while our study found that people who were trained by diabetes educator are more confident about safe disposal practices¹⁴. A study performed in UAE by Sharif et al found that about two third of their participants acquired knowledge about insulin usage from their healthcare professionals however only half of the participants were educated about safe disposal of the waste¹⁵.

Another study by RS Poudel et al conducted in Nepal came up with very interesting findings. Almost all of their patients were using incorrect disposal techniques with most of them disposing in the dustbin and some used to burn the waste which is contrary to our study where almost all of the patients dump the waste in household dustbin¹⁶.

A Pakistani study by Osama Ishtiaq et al with the almost same sample size as of our study with 375 participants found that almost 90% of their participants dispose of their waste into common garbage dustbin. This is consistent with our data where almost similar percentage of patients used common garbage dustbin¹⁷.

All the studies have almost finding of very low level of education of the people about the safe disposal of the waste.

CONCLUSION

The issue of unsafe disposal of the insulin waste is a global problem and there is very little stress on educating the people about proper disposal techniques and its implications on spreading the infections. There is needed to make guidelines and incorporating it into the diabetes education program with full emphasis on this issue.

Conflict of interests: None

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