

RES-366: Characteristics of Needlestick Injuries Caused by Pen-Type Injector Needles



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Introduction

Needlestick injuries (NSIs) caused by pen-type injector needles have been reported more frequently in Japan compared with the United States. After insulin injection, blood contamination of the needle and backflow into the injector may occur, making reuse strictly prohibited. However, improper handling or disposal of these devices can still result in NSIs. This study aimed to characterize the circumstances of NSIs involving pen-type injector needles and compare them with those caused by other hollow-bore needles, in order to propose effective preventive measures.

Materials and Methods

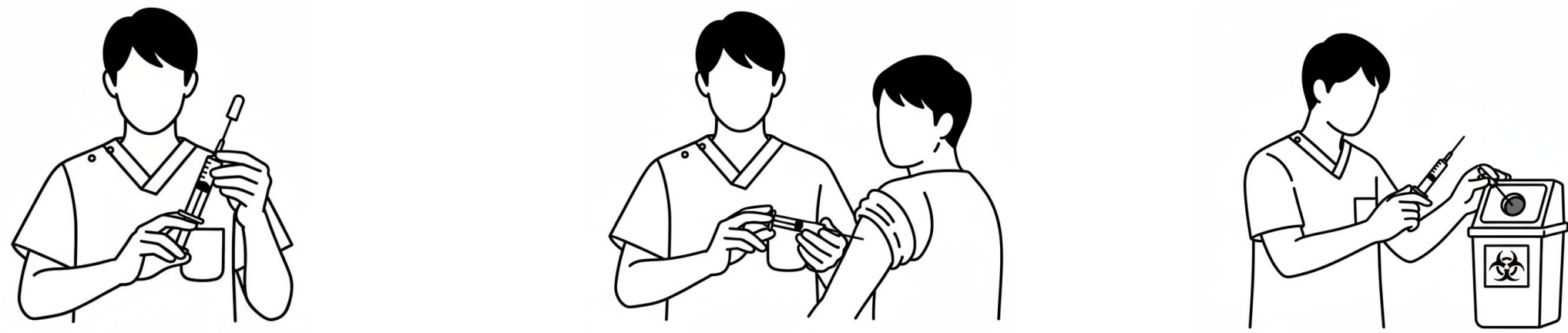
Using data from EPINet 2024 (65 facilities, 6,799 cases, study period 2021-2023), we compared needlestick injuries caused by **pen needles (Group P: 426 cases)** with those caused by **other hollow-bore needles (Group H: 2,967 cases)**. For each group, we analyzed age, years of experience, occupation, location of occurrence and circumstances of occurrence. Continuous variables were tested using the Mann-Whitney U test. Categorical variables were analyzed using the chi-square test.

Results

1. Participant characteristics (gender, age and years of experience) are summarized in Table. Median age and years of experience were similar between groups. In Group P, 97% were nurses, and 2.7% were medical-related service staff (e.g., cleaning, waste disposal), almost double the proportion observed in Group H.

	Male/Female	Age	Years of Experience	Occupation		
				Resident / Trainee	Nurse / Nursing Assistant	Medical-related Service
Group P	43 / 383	32.4 (24-38)	7.59	0.2 %	97.1 %	2.7 %
Group H	976 / 1,991	32.4 (25-37)	7.38	44.1 %	54.5 %	1.4 %

2. Regarding the timing of needle use, the proportions of injuries occurring before, during, and after use were 22.9%, 10.4%, and 66.8% in Group P, compared to 6.6%, 44.0%, and 49.4% in Group H, respectively, with **Group P showing significantly higher rates of injuries before and after use (p<0.01)**.



	Before Use	During Use	After Use
Group P	22.9 %	10.9 %	66.8 %
Group H	6.6 %	44.0 %	49.4 %

3. Detailed analysis revealed that cases involving used devices left on tables or other places occurred in **14.9 %** of Group P cases compared to 3.9 % of Group H cases, representing **approximately a 4-fold higher rate**.

	During equipment disassembly	With equipment protruding from garbage	Used equipment left on tables or other places
Group P	14.6 %	1.4 %	14.9 %
Group H	6.1 %	4.4 %	3.9 %

Discussion

This study demonstrated that pen-type injector needles are associated with significantly higher proportions of NSIs occurring before and after use, compared with other hollow-bore needles. **Improper disassembly or disposal, as well as leaving used devices unattended, were identified as key risk factors.** In Japan, the relatively high frequency of pen-type injector-related NSIs may be explained by:
1 Widespread use of insulin pens in home- and outpatient-care settings.
2 Insufficient availability or use of sharps disposal containers outside hospitals.
3 Limited patient awareness regarding safe post-use handling.

Conclusion

Needlestick injuries from pen-type injector needles occur disproportionately before and after use, with improper disposal representing a critical risk factor. To effectively reduce these injuries, **combined approaches involving patient education, safer device design, and standardized disposal protocols are essential.**