Needlestick Injuries During a Mass Vaccination Campaign

Erika Abraham, MD,¹ Dean Middleton, MSc²

Nurses implementing mass vaccination campaigns may be exposed to bloodborne pathogens in the event of a needlestick injury. In preparation for a mass immunization campaign, information was sought to decrease the number of needlestick injuries. A literature search revealed no information pertaining to needlestick injuries occurring during mass vaccination campaigns. Other studies discussed the difficulty in obtaining information related to the frequency and reason for percutaneous injury in health care workers.^{1,2} A questionnaire was designed to identify risk factors for needlestick injuries occurring during a mass vaccination campaign in York Region, Ontario. This paper describes the findings.

METHODS

In Ontario, a routine two-dose measles mass vaccination campaign was implemented in 1996 for all school-aged children (approximate York Region student population = 130,000). This was the first mass immunization campaign for the majority of York Region Health Services' nurses (a previous immunization campaign for hepatitis B was implemented by nine nurses in the Sexuality program). Prior to the campaign, a two-day "Skills Development Workshop" for nurses included information on sharps handling and sharps injury follow-up.

Completing an "Incident Report" is mandatory by legislation of the *Occupational Health and Safety Act* and the *Workers Compensation Act* for all accidents including needlestick injuries. The "Incident Report" form would have been insufficient, however, to acquire information on needlestick injury risk factors. Therefore, a needlestick injury questionnaire was developed and provided to the nurses' team leaders.

RESULTS

During an 18-week period beginning February 1996, 63 nurses immunized 112,727 children in kindergarten to Grade 13 at 238 schools. Thirteen needlestick injuries were reported during the campaign which is the equivalent rate of 1 needlestick injury per 8,671 vaccinations. Three accidents occurred in February, three in March, four in April, two in May and one in June. Vaccinations were provided during regular school hours between 8:30 a.m. to 2:30 p.m. Eight of the injuries occurred in the morning, four in the afternoon. All injuries occurred while immunizing students in grades 1 to 8.

Seven of the accidents occurred prevaccination (with a sterile needle) and six postvaccination (with a contaminated needle). Of the prevaccination accidents, two occurred while filling syringes and five immediately prior to vaccinating. Of the postvaccination accidents, four occurred immediately after vaccinating and two during disposal of used needles.

Nine of the injuries were moderate (skin punctured, some bleeding) and four were superficial (little or no bleeding). No severe injuries (deep stick or profuse bleeding) were reported. In addition to the injury

locations revealed in Figure 1, one injury was located in the thigh (one location not reported). Reports on the circumstances preceding the injury included accommodating a fainter (1), distraction (noise in general (1) or special entertainment (clown)(1)), lack of appropriate restraint of younger children (2), difficulty removing the cap of the needle (2), lack of an ideal setting (1), a last-minute change of the room assigned for immunization (1), and fatigue after immunizing for seven consecutive work days (1) [responses missing (3)].

DISCUSSION

It was hypothesized that an increased number of accidents would have occurred in the early part of the campaign when nurses were less experienced with mass vaccination campaigns, however, the data did not reveal any temporal pattern. It was also hypothesized that more accidents would occur later in the day as a result of fatigue, however, the distribution of accidents over the day did not support this. All injuries occurred while immunizing younger children (grades 1 to 8), no injuries occurred while vaccinating high-school students. This data supports nurses' claims that vaccinating younger children is more difficult.

None of the injuries were severe. Less risk of bloodborne pathogen transmission occurs after superficial or moderate injuries. Circumstances leading to the needlestick injury varied and included technical factors (stuck needlecap, clinic layout) and human factors (distraction, lack of restraint, fatigue). Four (31%) of the accidents occurred unrelated to the actual vaccination (i.e., either during filling syringes (2) or disposing of used needles (2)). These accidents might be considered

York Region Health Services, Planning and Evaluation Division, Newmarket, ON

1. Communicable Disease Co-ordinator

2. Epidemiologist

Correspondence and reprint requests: Erika Abraham, York Region Health Services, 17,250 Yonge Street, Box 147, Newmarket, ON L3Y 6Z1, Tel: 905-895-4511, Fax: 905-895-3166, E-mail: yrphu@hookup.net

Figure 1. Location of needlestick injuries on the hands.

preventable by fully implementing the preventive measures included in the "Skills Development Workshop" whereas the remaining nine (69%) accidents which occurred in the period immediately surrounding vaccination were potentially beyond the control of the vaccinator.

In conclusion, the reported needlestick injury rate of 1 injury per 8,671 vaccinations was considered to be low. Difficulties identifying risk factors for needlestick injuries resulted because of the small number of accidents. Although some unreported injuries may have occurred, it is unlikely that the rate of injuries would have increased significantly or would have added much to the identification of risk factors. The reported risk factors con-

firmed that critical issues such as clinic layout, appropriate restraint, and sharps disposal should be reviewed in preparation for a mass immunization campaign to minimize the number of needlestick injuries, and thus minimize the risk of exposure to bloodborne pathogens.

REFERENCES

1. Hibberd PL. Patients, needles, and health care workers. *J Intravenous Nursing* 1995;18(2):65-76.
2. Martin LS, Hudson CA, Strine PW. Continued need for strategies to prevent needlestick injuries and occupational exposures to bloodborne pathogens. *Scand J Work Environ Health* 1992;18 suppl (2):94-96.

Received: October 21, 1996

Accepted: November 2, 1996