

Assessing the Utilization of Needle-Stick Injury Protocols by General Practices in Liverpool

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Rec Date: Nov 16, 2015; Acc Date: Feb 17, 2016; Pub Date: Feb 23, 2016

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Abstract

Background: Needle-Stick Injuries (NSIs) incur huge financial, emotional, social and economic costs, and therefore constitute a serious global burden of disease. Protocols to manage NSIs at the primary care level are in place to ensure both staff and the public are well protected.

Aim: This study aims to assess the utilization of NSI Protocols by General Practices in Liverpool, with respect to the North-West of England regional guidelines.

Design and Setting: This is a cross-sectional survey, focusing on 77 general practices in Liverpool, North-west of England.

Methods: Self-administered, pre-piloted questionnaires were distributed by post, email, and personal delivery to Practice Managers in the GP Surgeries. Completed forms were analyzed.

Results: The study achieved an 82% response rate (63 responses out of 77). Eight (12.9%) of the Surgeries witnessed NSI cases in the preceding 12 months. Five (62.5%) of these Surgeries reported cases among the public, while the rest were among Practice staff. About 90% of the practices were aware of the regional NSI Policy, though 87.3% actually possess it. Less than 14% had difficulties adopting or implementing recommended guidelines, mostly from not knowing who to contact if help is needed. There was no association between Practice Size and the Possession of Policy ($\chi^2 = 0.002$; $P = 0.99$).

Conclusion: The awareness, adoption and implementation of the recommended NSI policy among Surgeries in Liverpool are quite high. However, efforts should be made to maximize possession and limit difficulties in the implementation of the policies.

Keywords: General practices; Surgeries; Needle-stick injuries; Sharps; General public; Community

Introduction

Needle Stick Injuries (NSIs) are defined as penetrating stab wounds from needles (or other sharps) that may result in exposure to blood or other body fluids [1]. They are part of inoculation injuries, which also include splashing of body fluids on mucous membranes, as well as human bites [1]. Health Care Workers (HCWs) are at increased risk worldwide, [2] but NSIs also occur among the general public, where they are called Community Inoculation, to distinguish them from those seen among HCWs [3].

In the UK, an estimated 100,000 people are affected yearly, [4] even though up to ten-fold go unreported [5]. NSIs are the 2nd commonest cause of injuries in the National Health Service, NHS (17%), behind Manual Handling (18%) [2,6,7].

The medical costs of NSIs are substantial. Unofficial sources estimate the financial burden on the NHS to be between £160,000 and 176,000 per annum [2,8]. These are just costs from blood tests,

prophylaxis and treatment of accompanying injuries and infections, but a lot more goes into associated lost-work productivity, legal matters, claims and compensations [2]. The risks posed by NSIs are also applicable to the public, since discarded sharps (including used needles, syringes and razors) are usually found in public places like beaches, parks, playing fields, alleyways and communal stairways [1].

The World Health Organisation (WHO), in recognition of the worldwide prevalence and heavy financial and psychosocial burden of NSIs proposed primary prevention and the adoption of policies as a major preventive approach [9]. In the United Kingdom (UK), the National Audit Office, NAO, in 2003, [7] backed by the findings from a published study, [8] pointed out the need for policies to guide in the better management of NSIs.

This study focuses on the published policies to limit post-injury infections, with particular reference to that issued in the North West (NW) of England by the North-West Health Protection Agency (HPA) (Appendix 1). Initially issued in June 2005 and reviewed in 2007, the Policy, containing the "Guidance for Health Care Professionals" on the management of inoculation injuries in community settings, was distributed among Acute Trusts and the then Primary Care Trusts

(PCTs), including General Practitioners and Practice Nurses in the North-west of England. No published study had ever assessed the adoption and utilization of this policy by general practices since it was issued, and this study aimed to fill this gap. Worryingly, a study conducted in Wales in 2007 reported that about 1 in 5 Surgeries had no such policies, [1] while a 1995 survey of General Practices in Liverpool [10] found that as much as 85% had no written policy on infection control, while a third had none on NSIs. On the Liverpool survey, three-quarters of the responding Surgeries at the time indicated that they were willing to welcome infection control guidelines.

In addition to the foregoing, almost all documented studies to date on NSIs are among Health Care Workers (HCWs). Very little research has been conducted among the general public, and sparse data can be found in the literature concerning Liverpool. This study also hopes to fill this gap.

In summary therefore, the specific objectives of this paper include:

- to ascertain the level of awareness of the existence these policies by the general practice Surgeries.
- to ascertain the level of adoption and possession of such policies.
- to estimate, crudely based on self-reports, the number of Practices witnessing NSIs over a 12-month period.
- to see how much of these occur among the general public, vis-a-vis Practice Staff.
- to see if there is any association between Possessing the Policy and Practice size.
- to find out the difficulties militating against the adoption of these policies.

Methods

Setting

The study focused on the 105 general practices in the then Liverpool Primary Care Trust (PCT), which was one of the original five PCTs in the Merseyside region. This PCT, now replaced by the Liverpool Clinical Commissioning Group (CCG) since April 1 2013 [11], serves a population of about 466,415 according to the 2011 census [12]. This research was carried out between May and August 2008, and looked at events in the preceding 12 months.

Participants

A total of 77 Surgeries in the then Liverpool PCT constituted the final study population. This was trimmed from a list containing the names, addresses and phone numbers of an original 105 registered Practices in the study area. Initial phone calls revealed that some in the original number were branches of others, and, for the purpose of the study, such practices were classed as one, as they would arguably have the same NSI policies.

Sample size estimation

Out of the 77 Practices, a sample size of 58 (75%) was worked out to be the minimum needed to give sufficient power to the study for identifying a robust estimate of the percentage of General Practices with NSI policies in place. Noting that a previous study in North Wales [1] showed that about 81% of GPs have policies in place for the management of NSIs, the Statcalc tool in EpiInfo Version 6, was used

to estimate the sample size, allowing for an error margin of +/-5% with a 95% Confidence Interval.

Design

A Cross-sectional Survey, using anonymized, self-completion questionnaires, was adopted. The Practice Managers (PMs) of the respective Surgeries were the target respondents, as they were expected to have the best administrative knowledge of the procedures adopted by their Surgeries [1]. During the initial contact phone calls, PMs were offered a choice of how to receive the questionnaires (posted, emailed or self-delivered). This offer was aimed at boosting their co-operation, thereby improving response rate. Approximately 82% of the 77 questionnaires were delivered by post, 11% by hand, and 7% via e-mail. Two follow-ups were made as agreed with the ethical committees.

The questionnaire

There was no validated, off-the-shelf questionnaire suitable for this study. Therefore, one was constructed based on information from the North-West NSI policy. It was piloted with 10 General Practices outside the Liverpool PCT. No amendment was made after the pilot, as all respondents felt that the questions, choice of words, length, etc., of the instrument were appropriate.

Data analysis

Analysis was done using the SPSS version 15.0. Baseline findings and characteristics of the studied population were first explored. Then other aspects were analysed, while correlations and associations were assessed using appropriate statistical hypotheses.

Results

Basic summary

A total of 63 of the 77 questionnaires were returned, making an 81.8% response rate. Table 1 summarizes the characteristics of the responding Surgeries.

	Number of patients	Number of doctors
Mean	5852	4
Minimum	2000	1
Maximum	12500	10

Table 1: Summary of number of registered patients and doctors in Surgeries in Liverpool.

Policy awareness, possession and NSI incidence rate

A total of 55 of the 63 (90.2%) responding Surgeries indicated an awareness of the national/regional guidelines on NSI management. Of these, 87.3% actually possess NSI policies. Eight of them had witnessed cases of NSIs within the preceding one year. Out of this eight, six (75%) recorded less than five cases in the 12-year period, with only two (25%) seeing more than 10 (Table 2).

Also, majority (62.5%) of the cases occurred among the general public, while 37.5% occurred among the Practice Staff. Of the eight practices reporting cases of NSIs, none reported any sero-conversion.

	Response	Frequency (%)	Total (%)
No of Cases seen in Practices	05-Jan	6 (75.0)	8 (100)
	10-Jun	0 (0)	
	>10	2 (25.0)	
Groups were Cases Occurred	Public	5 (62.5)	8 (100)
	Staff	3 (37.5)	
Sero-conversions	Yes	0 (0)	8 (100)

Table 2: Characterization of cases of Needle Stick Injuries recorded among General Practices in Liverpool.

Difficulties in policy adoption and reasons for them

Of the 57 Practices responding to the question of whether or not they encountered difficulties with NSI Policies, 49 (86%) said they had none (Table 3).

Response		Frequency	Percent	Valid Percent
Valid	No	49	77.8	86
	Yes	8	12.7	14
	Total	57	90.5	100
Missing System		63	100	100

Table 3: Difficulties in adoption or use of Needle Stick Injury Policy by Surgeries in Liverpool.

Table 4 summarizes the reasons for the encountered problems. Of the eight that encountered difficulties only two said the problems where due to poor awareness of the policies, while the remaining six had problems knowing who to contact when they need assistance on any aspect of the policy. All responding Practices felt they got satisfactory responses from available contacts when seeking advice.

Response	Frequency (%)	Total Answered (%)
Poor Awareness	2 (25.0)	8 (100)
Who to contact	6 (75.0)	
Never gets satisfactory responses	0 (0)	

Table 4: Reasons for encountered difficulties in adoption or utilisation of needle stick injury policy by surgeries in Liverpool.

Association between size of practices and possession of policy

The Number of Patients in a Surgery was used as a reflection of the Practice Size. They were first grouped into categorical variables and were then cross-tabulated against Policy Possession. Chi-square hypothesis test was then used to test for significance (Table 5).

This gave a test statistic of 0.002 ($p=0.99$), indicating that size of practice did not have an association with possession of NSI policy.

Category (No of Patients)	Possession of Policy		Total
	No	Yes	
1.00 (2000-3550)	2	14	16
2.00 (3551-8500)	4	27	31
3.00 (8501-12500)	2	14	16
Total	8	55	63
P-value = 0.99, derived from Chi-squared tests (statistic = 0.002)			

Table 5: Cross-tabulation showing Associations between the number of patients registered by a Surgery in Liverpool, and the Possession of Needle Stick Injury Policy by them.

Discussion

The 81.8% response rate from this study is deemed satisfactory, and was higher than the 1995 study of the same Liverpool (75%) [13] and another from Minnesota (52%) [14]. The rate is somewhat less than some from a similar study in Durban in 2001 which had a 91% response rate [15].

The study's NSI rate of nearly 12.9% seems to differ, at least on the surface, from the report by Atenstaedt in 2003 [1] which documented a 64% rate among Surgeries in North Wales. However, the Welsh report was over a 5-year period, and for this reason, the comparison should be treated with caution.

This study also found a higher rate of NSIs among the general public compared to that of Clinic staff. This differs from the North Wales [1] study cited above, which found the rate higher in the Practice staff (46%), compared to that in the public (41%). The difference in location for the two studies might be responsible for this, but there is a chance that differences in policy adoption and implementation among other variables may also be contributory.

No case of sero-conversion was reported. This is in line with similar published studies, which found that seroconversions following NSIs were very rare [16,17].

Given that the North-west regional guideline was first introduced only three years prior to this survey, it is impressive to discover that about 90% of Liverpool GPs were aware of its existence, and that just a little less than that (87.3%) do have NSI policies in place. This is a very important finding, since in a study of the same practices in the same Liverpool 13 years earlier [13] as much as 85% had no such policy.

This study also discovered that an overwhelming majority (86%) of the GPs had no difficulty with the recommended NSI policy. Unfortunately, there was no previous study found in the literature to compare these findings with.

The study failed to establish a significant relationship between the Size of the Practices and the Possession of Policies. This is against expectation as suggested by a previous US-based study [14], which showed that large metropolitan hospitals tend to follow standard recommendations compared to the smaller ones.

Study Limitations

One limitation was that the study relied on mere estimates from the Practice Managers to determine the NSI incidence rates, and this

might have introduced some elements of bias. Involving other clinic staff like the doctors and nurses might have reduced this bias, but this would have made the study more time-consuming and complex.

Another limitation was that the various factors that might have influenced the choice of individual practices in the adoption and implementation of the policies were not explored. Hopefully, future studies can be designed to tackle this.

Implications for Practice and Research

Implications for practice

Based on the findings, this study recommends that though uncommon, attention on NSIs at the primary care level should not be relaxed since most occurrences at this level still affect more of the public compared to hospital staff. Also, despite the impressive level of awareness and possession of NSI policies, there is still room for improvement. The 13% that still lack this policy can be brought even lower, and a 100% adoption-rate should be the ultimate goal. Public awareness should be enhanced to make them aware of available treatments, and this can be achieved by regularly engaging all stakeholders through seminars and symposia at various levels. Also, the standard guideline should be available on a well-advertised and accessible website, while printed copies should be provided to all Surgeries within Liverpool.

Implications for research

There are a few areas future researchers may want to look into. First, the earlier Liverpool study in 1995 [13] observed poor records on NSI cases. Though this present study attempted to allow participants make crude guesses, it had no way of knowing if there were proper records on the cases. A future research may want to find out if such records are being kept. Also, the factors influencing the dispositions of Surgeries towards adopting and implementing these policies might be explored with future studies. Finally, a more detailed analysis of the training package of the respective practices for their staff on NSIs may need to be explored. This might include aspects of the Policy like initial management, risk assessment, and further actions after injuries.

Summary/Conclusions

With the aims and objectives in mind, this study concludes as follows:

1. NSIs are fairly uncommon presentations in General Practices in Liverpool, with a 12.9% incidence rate.
2. Majority (62.5%) of the cases occurred among the general public, while the remaining 37.5% are seen among Practice Staff.
3. There is a very high awareness (90%) among the General Practices in Liverpool of the existence of the Regional NSI Policy.
4. An overwhelming majority (approximately 87%) of the Surgeries do possess the Policy.
5. The size of the individual practices does not determine whether a Practice possess the policy or not.
6. A huge majority (86%) of the Practices have no difficulties either in the adoption, or on the implementation of the Policy. Of those who do have difficulties, most (75%) arise due to poor knowledge on who to contact when necessary.

Funding

Altogether, £252.79 was spent on this research, borne solely by the researcher.

Ethical Considerations

Ethical approval was obtained from the Liverpool Paediatrics Research Ethics Committee, while a Research and Development (R&D) approval was also obtained from the Research Management and Governance Committee of the Liverpool PCT.

Competing Interests

The researcher declares no conflicting interests.

Acknowledgements

My immense thanks and appreciation go to the following

Joanne Dillon, the then Infection Control Lead, Liverpool PCT, for helping develop the whole idea from the very beginning, and providing most of the documents, information and contacts required.

Gabrielle Marr, the then Research Governance & Development Manager Liverpool PCT, for her contributions in providing vital documents and contacts. Ms Jan Nugara, former Public Health Programme Administrator (currently the Research & Finance Team Leader, Institute of Translational Medicine), Liverpool University, for her time and commitment in maintaining correspondence during the study.

References

1. Atenstaedt R, Payne S, Roberts RJ, Russell IT, Russell D, et al. (2007) TNeedle-stick injuries in primary care in Wales. *J Public Health (Oxf)* 29: 434-440.
2. Kennedy D (1988) Needlestick injuries: mechanisms and control. *J Hosp Infect.* 12: 315-322.
3. Rosenstock L (2000) Statement for the record on Needlestick Injuries.
4. Frederick L, Williams J (1999) Characterization of needlestick injuries and development of prevention strategies. *Journal of Healthcare Safety Compliance and Infection Control* 3: 382-390.
5. Paul Leigh J, Gillen M, Franks P, Sutherland S, Nguyen HH, et al. (2007) Costs of needlestick injuries and subsequent hepatitis and HIV infection. *Curr Med Res Opin* 23: 2093-2105.
6. Elmiyeh B, Whitaker IS, James MJ, Chahal CAA, Galea A, et al. (2004) Needle-stick injuries in the National Health Service: a culture of silence. *J R Soc Med* 97: 326-327.
7. Elder A, Paterson C (2006) Sharps injuries in UK health care: a review of injury rates, viral transmission and potential efficacy of safety devices. *Occup Med* 56: 566-574.
8. Department of Health, N.H.S.E. (1998) The management of health, safety and welfare issues for NHS staff.
9. Susan Q Wilburn, Gerry E (2004) W.H. Preventing Needlestick Injuries among Healthcare Workers.
10. <http://webcache.googleusercontent.com/>
11. <http://www.liverpoolccg.nhs.uk/>
12. <http://liverpool.gov.uk/council/key-statistics-and-data/census/census-background/>
13. White RR, Smith J (1995) Infection control in general practice: results of a questionnaire survey. *J Public Health Med* 17: 146-149.

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14. Thurn J, Willenbring K, Crossley K (1989) Needlestick injuries and needle disposal in Minnesota physicians offices. *Am J Med* 86: 575-579.
 15. Yengopal V, Naidoo S, Usuf M (2001) Chikte, Infection control among dentists in private practice in Durban. *SADJ: journal of the South African Dental Association= tydskrif van die Suid-Afrikaanse Tandheelkundige Vereniging* 56: 580-584.
 16. Papenburg J, Blais D, Moore D, Al-Hosni M, Laferriere C, et al. (2008) Pediatric injuries from needles discarded in the community: epidemiology and risk of seroconversion. *Pediatrics* 122: e487-e492.
 17. Russell FM, Nash A (2002) prospective study of children with community-acquired needlestick injuries in Melbourne. *J Paediatr Child Health* 38: 322-323.