ISSN: 2223-9553
Volume 1, Issue 3, November 2011

NEEDLE STICK INJURY PATTERN AMONG HEALTH WORKERS IN PRIMARY HEALTH CARE FACILITIES IN ILORIN, NIGERIA

Dr. Bolarinwa Oladimeji Akeem
Department of Epidemiology & Community Health,
University of Ilorin, NIGERIA
drdeji@yahoo.com

Dr. Asowande Abimbola
JSI/AIDSTAR-One
Abuja,
NIGERIA
asowande@rocketmail.com

Akintimi Clement Idowu
JSI/AIDSTAR-One
Abuja,
NIGERIA
clemsakintimi@yahoo.com

ABSTRACT

Injection is the most common health care procedures in both formal and informal health sector and people in developing countries receive unnecessarily high level of injection annually putting them at risk of Needle Stick Injury (NSI). The cost and consequences of NSI have been documented to be high and yet not accounted for by the health authority. The objective of this study was to determine the pattern of NSI among the health workers in Primary health care facilities in Ilorin, North central Nigeria. It was a descriptive cross-sectional study of 247 Primary Health Care Workers (PHCWs) in 2 out of 3 Local Government Areas (LGA) of Ilorin metropolis. Questionnaires and Observational checklists were the data collection instruments and data was analyzed using Epi-info software package with a level of significant set at p-value of $\leq$ 0.05. It was observed that 78.5% of PHCWs claimed they recapped needle while recapping of needle was observed in 85% of the health facility. Thirty one percent of the health workers have had NSI and only 19.5% of them reported the injury to the health authority. It was concluded that there was indication of poor injection safety and moderately high incidence of NSI among PHCWs in Ilorin.

Keywords: Needles Stick Injury, Injection, Health workers, Ilorin.

INTRODUCTION

Injections are skin piercing procedures performed with a syringe and needle to introduce a substance into the body for prophylactic, diagnostic, curative or recreational purposes (Simonsen et al 1999). Injections can be given intravenously, intramuscularly, intradermally or subcutaneously. Other skin piercing procedures like blood transfusion, surgery, tattoo, acupuncture and body piercing are excluded from this definition. Needle Stick Injury (NSI) is the non intentional puncture of the skin caused by an injection needle while sharps injury are caused by puncture of the skin by a sharp objects or instruments including an injection injury (Reeler, 1990; Hutin et al., 2003). NSI is a cardinal indication of poor injection safety practices by health workers (Reeler 1990; Hutin et al., 2003). The invention of the syringe in 1848 opened a new channel for pathogens to pass from one person to another (Drucker et al., 2001). The first recorded outbreak of what was later identified as hepatitis B infection may have occurred in a Swedish factory in 1883, following smallpox vaccinations (Ringertz, 1972). Although it was widely recognized that jaundice followed injections to treat syphilis in the early decades of the 20th century, Doctors blamed injected arsenic rather than a contaminating pathogen. In 1943, Bigger (Bigger, 1943) and MacCallum (Mac-Callum and Baur, 1944) showed that non-sterile injections transmitted a pathogen that caused jaundice hence, the first safe injection initiative began almost 100 years after the first injection.

Injection proliferation

Injection therapy was first introduced to the developing world population with the mass campaigns against Yaws and Kala-azar in the 1920s, and became wide spread after Second World War following the introduction of penicillin (Nyatt, 1984). Over the last 50 years, scientists have discovered new blood borne pathogens. In 1967, the Australian antigen – currently known as Hepatitis B Virus surface antigen (HBsAg) was first linked to viral hepatitis (Nyatt, 1984). In 1983, human immunodeficiency virus (HIV) was found in blood (Nyatt, 1984). In 1989, the hepatitis C virus (HCV) and its' antibodies were identified. Episodes of transmission of blood borne pathogens through injections are usually linked to the unsafe injection handling in formal and informal health settings.

Today Injection is one of the most common health care procedures in both the formal and informal heath care sector (Hauri et al., 2003). People in developing and transition countries received an estimated 16 billion injections each year, of which 6.6 billion were given with equipment reused in the absence of sterilization (Hauri et al., 2003). The vast majority, about 95%, are given in curative care while immunization accounts for about 3% of all injections, with the remainder for other indications, including use of injections for transfusion of blood and blood products and contraceptives. In certain regions of the world, use of injections has completely overtaken the real need, reaching proportions no longer based on rational medical practice. In some situations, as many as nine out of ten patients presenting to a primary healthcare provider receive an injection, over 70% of which are unnecessary or could be given in an oral formulation (Hauri et al., 2003).

Needle Stick Injury (NSI)

The administration of injection takes place in the formal health settings which includes public and private health providers and informal settings like patent medicine shops, quack clinics, traditional / herbal clinic and at home (Reeler, 2000). Over 80% of NSI can be prevented with the use of safe needle devices, which in conjunction with workers' education and training and work practice controls can reduce injuries by over 90% (FMOH/JSI/MMIS, 2006). Needle stick injuries account for more than 18,000 new cases of hepatitis annually worldwide and in Nigeria the preliminary treatment cost for a single NSI incident is estimated to be between 65,000 and 390,000 Nigerian Naira (FMOH/JSI/MMIS, 2006). All health workers are at risk of NSI while the management of NSI is as important as prevention of NSI. Four key elements are important in the management of NSI which are; Provision of Post Exposure Prophylaxis (PEP), Monitoring and reporting of injuries through injury register, evaluating injuries and conducting follow up. Reporting of NSI by the health worker is also poor making records on the incidence not available. Also the PEP is not well instituted in the country while majority of the workers are not vaccinated against Hepatitis B infection (FMOH/JSI/MMIS, 2006).

Needle Stick injury pattern in developing countries

Needle recapping is a major indicator of unsafe injection practice and there is high level of needle recapping in developing countries (FMOH/JSI/MMIS, 2006). A cross country survey in Nigeria showed 80% prevalent of recapping while Studies in Burkina Faso (Fitzner et al., 2004), Oman (Al-Awaidy et al., 2006) and Swaziland (Daly et al., 2004) showed 56%, 28% and 31% respectively. Local studies in Nigeria revealed high prevalence of needle recapping in PHC facilities (Musa, 2005) but low prevalence in tertiary health facilities (FMOH, 2005). In Nigeria, like any other developing countries the incidence of NSI is placed at 45% (FMOH/JSI/MMIS, 2006), while in Ilorin needle stick injury has been reported to be as high as 57.8% among health workers (medubi et al., 2006). A similar study in Lagos, Nigeria reported 72.9% (Odeyemi et al., 2005), Swaziland study revealed more than 30% incidence among nurses (Daly et al., 2004), 17.9% in Oman (Al-Awaidy et al., 2006) and 23.5% in Dominican Republic (Moro et al., 2007).

Consequences of Needle Stick Injury

The first reported case of needle-stick transmitted HIV infection (Anonymous, 1984) led to increased awareness and concern about the risks to health-care workers posed by NSI. Today, it is clear that percutaneous injuries to health-care workers from needle sticks and other sharps carry significant risks of transmitting bloodborne pathogens such as Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV). It is estimated that sharps injuries cause about 66,000 HBV, 16,000 HCV and 200 – 5000 HIV infections globally among health-care workers each year (Pruss-Ustiin et al., 2002). HBV and HCV are responsible for hepatocellular carcinoma, liver cirrhosis and hepatitis worldwide (Tobenson and Thomas, 2002) and for health-care workers world-wide, the attributable fractions for percutaneous occupational exposure to HBV, HCV and HIV are 31.9%, 39.9% and 5.4%, respectively (FMOH/JSI/MMIS, 2006). The estimated burdens of these diseases that are due to unsafe injections worldwide are 21million new cases of HBV, 2million cases of HCV and 260,000 new cases of HIV/AIDS.

These blood-borne infections have serious consequences, including long-term illness, disability and death. In addition to HBV, HCV and HIV, other pathogens may be transmitted to health-care workers by NSI, including those that cause tuberculosis, diphtheria, herpes, malaria, Ebola, plague, and Epstein-Barr infection (Khan et al., 2000). This does not preclude the possibility that other infections may gain importance in the near future. The current global burden at the beginning of this millennium due to past and present unsafe injection practices reached 501,000 deaths, with the majority of deaths occurring in Asia and among persons aged ≥15 years (n = 444,000, 88%). When death and disability were combined, the burden reached 10,461,000 DALYs, with a similar predominance in Asian adults (n = 8419000, 81% of DALYs among persons aged ≥15 years). Taken together, viral hepatitis B and C and their chronic consequences accounted for 74% and 61% of the deaths and DALYs, respectively, and HIV accounted for the remainder (Hauri et al., 2003). However, quantification of NSI burden is still unavailable in Africa which made the serious consequences of NSI injury to go unnoticed.

Objectives

The main aim of this study was to determine the Needle Stick Injury (NSI) pattern among the Primary Health Care Workers (PHCWs) in Ilorin and to identify factors that are affecting the NSI.

MATERIALS AND METHODS

This is a descriptive cross-sectional study which was carried out among 247 Primary health Care Workers (PHCW) in private and public Primary Health Care (PHC) facilities in Ilorin, North Central of Nigeria. Ethical approval was obtained from the ethical committee of the University of Ilorin Teaching Hospital, Ilorin after which an advocacy visits were paid to the Local Government Areas health Department. The study population was all the PHCWs that were involved in both preventive and curative primary health care services in the study area and this formed the sample frame. The minimum sample size was determined using formula; Z^2pq/d^2 (Araoye, 2003). Multi stage random sampling was used to select the 247 consented PHCWs in 2 out of 3 Local Government authorities (LGAs) in Ilorin metropolis. The 2 selected LGAs was by simple random sampling by balloting while a total of 20 Primary Health Care (PHC) facilities were included using simple random sampling by balloting from the 2 selected LGAs. At the PHC facilities there was proportional allocation of the PHCWs by their cadre and systematic random sampling was used to select 247 PHCWs with sampling interval between 3 and 4. The workers whose jobs were not directly related to Health care delivery services and handling of injections were excluded from this study. Data was collected with the use of pretested semi structured questionnaire and observational checklist in all the 20 PHC facilities. Data was analyzed using Epi-info software package and level of statistical significance was set at p-value of ≤ 0.05.

RESULT

One hundred and eighty five (74.9%) of the PHCWs in the study were within Age group 30 – 49 years (Table I) and their population was predominantly female (93%). Community Health Extension Workers (44.9%) and Nurses (26.7%) dominated the workforce (Table I). Over 80% of these PHCWs had above 6 years of work experience. However, only 31% of the PHCWs had previous training on safe injection practices. Ninety three percent of the PHCWs agreed that safety box was available in their health facilities while 95% of them claimed they always use safety box for the sharp waste disposal. (Table II). More than three quarter (78.5%) of the health workers said they recapped needle (Table II). Seventy seven PHCWs (31.2%) have had needle stick injury in the past out of which 35 (45.5%) had the needle stick injury in the last 3 months (Table II). Only 19.5% of those that had needle stick injury report the incident to the health authority (Table II).

Table 1. Socio-demography characteristics of the respondents

Variable	Frequency (%) N=247
Age range (years)	
20 – 29	44 (17.8)
30 – 39	77 (31.2)
40 – 49	108 (43.7)
50 – 59	18 (7.3)
Sex distribution	
Female	230 (93)
Male	17 (7)
Cadre	
Community Health Extension Workers	84 (34)
Registered Nurse and Midwife	66 (26.7)
Community Health Officer	27 (10.9)
BSc.	21 (8.6)
Others	49 (19.8)
Work Experience (years)	
< 1	12 (4.9)
1 – 5	36 (14.6)
6 – 10	54 (21.8)
> 10	145 (58.7)
Attendance of Injection safety training	
Yes	78 (31.6)
No	169 (68.4)

ISSN: 2223-9553
Volume 1, Issue 3, November 2011

Table 2. Pattern of Unsafe injection usage

Variable	Frequency (%) N=247
Availability of safety box	
Yes	231 (93.5)
No	16 (6.5)
Usage of safety box	
Yes	235 (95)
No	12 (5)
Sharp waste final disposal	
Dig burn and burry	152 (61.5)
Local incinerator	79 (32.0)
Open dumping	16 (6.5)
Rapping of needle	
Yes	194 (78.5)
No	53 (21.5)
Ever had NSI	
Yes	77 (31.2)
No	170 (68.8)
Had NSI in the last 3 months (N=77)	
Yes	35 (45.5)
No	42 (54.5)
Report NSI to Authority	
Yes	15 (19.5)
No	62 (80.5)

The observational checklist carried out in the health facility revealed that PHCWs in 9 (45%) out of 20 Primary Health Care (PHC) facilities used hand glove during administration of injection, recapping of needle was observed among PHCWs in 17 (85%) of the PHC facilities and needles were seen in other places other than safety box in 17 (85%) PHC facilities (Table III). Over 80% of the PHC facilities observed had safety box while only 5% and 15% of the facilities had stocks of disposable glove and needle/syringe respectively (Table III). The waste disposal methods observed (Table III) in the facilities were Did burn and burry (40%), Open burning (35%) and Local incinerator (25%).

Table III: Result of observation of injection practices in the facilities

Variable	Frequency	(%)	(N=20)
Usage of glove by health workers			
Yes	09	(45)	
No	11	(55)	
Recapping of needle by health workers			
Yes	17	(85)	
No	03	(15)	
Needle seen outside safety box			
Yes	17	(85)	
No	03	(15)	
Availability of safety box in the facility			
Yes	17	(85)	
No	03	(15)	
Availability of disposable glove in the facility			
Yes	05	(25)	
No	15	(75)	
Stock of needles seen in the facility			
Yes	03	(15)	
No	17	(85)	
Waste disposal methods observed			
Dig burn and burry	08	(40)	
Open dumping	07	(35)	
Local incinerator	05	(25)	

DISCUSSION

The PHCWs' age ranged between 20 to 59 years with close to three quarter of them falling within 30 to 49 years (Table I). This showed that majority of the PHCWs in the study area are older within productive age group as reported in a study in Nepal (Bhattarai et al., 2001) and Ilorin (Akande et al., 2005). The female predominates among PHCWs in this study and this corroborated the actual situations of most PHC facilities in Nigeria where nursing professions and other nursing related professions like Community Health Officers (CHO) and Community health Extension Workers (CHEW) are predominantly women (Obionu, 2007). More than half, 145 (58.7%) of the PHCWs in the study area had more than 10 years working experience. This reflected that the health workforce in the PHC setting of the study area are made up of older workers who would be involved in administrative role. It also showed a large group of workers that may be less likely involved in injection administrations. However, there is low capacity building of health workers on safe injection practices as shown by 31.6% of the health workers that had previous training on safe injection practice.

There was high availability (93.5%) and usage (95%) of safety box (Table II) and this high level of safety box usage in the study portends good sign for safe injection practices in the PHC facilities. The high availability of safety box was corroborated by the observational checklist of 85% (Table III). The final disposal of injection waste was predominantly dig, burn and burry (61.5%) and local incineration (32%). While "dig, burn and burying" is desirable for developing countries like Nigeria the use of local incineration may not be appropriate (Yanet et al., 2006) because of other health hazards that

could be associated with such practice (Lauret and Maher, 1998). But in contrast there were more open dumps (25%) observed at the health facilities compared to the health workers claim (6.5%) thereby showing that quite an appreciable number of health facilities still dispose their sharp waste indiscriminately. This finding was also supported by observation of high (85%) number of needles seen outside safety box in the PHC facilities. These are unsafe injection practice that put health workers, patients and the whole community at risk of NSI.

This study established that there was high level of needle recapping in both the respondents interview (78.5%) and during health facilities observation (85%). This findings were higher than the findings among tertiary health workers in Ilorin, Oman (28%) and Swaziland (31%) (Medubi et al, 2006; Al-Awaidy et al., 2006; Daly et al., 2004), but similar to Nigerian cross country survey of 80% needle recapping prevalence (FMOH/JSI/MMIS, 2006) and Burkina Faso by Fitzner et al (56%). This finding was a reflection of poor injection safety practices that characterized health care services in developing countries (Haile and Berhare, 1997). Other factors that predispose health workers to Needle stick injuries like non availability of stocks of needles and syringe (85%) and non availability of disposable glove (75%) were also observed in the PHC facilities.

Needle stick injury is an important cardinal indication of poor injection safety practices by health workers. However this study revealed 31.2% incidence of needle stick injury among PHCWs in Ilorin, similar to Nigeria prevalence (FMOH/JSI/MMIS, 2006) of 45%. This finding was also similar to other results reported in other developing countries like Oman (17.9%), Dominican Republic (23.5%) and Swaziland (30%). The finding from this study is however different from that obtained by Medubi et al and Odeyemi et al in Ilorin and Lagos respectively, in that they were basically tertiary health facilities based studies. There is a general under reporting of needle stick injury among health workers and a strong relationship between recap of needle and needle stick injury. In this study it was established that a similar trend existed where only 19.5% of PHCWs reported the NSI to the authority, similar to the study conducted in Oman where only 17.9% of health workers reported. The under reporting shown in this study means that quite a lot of NSI go on without documentation and appropriate management, exposing the PHCWs the more to dangers and consequences of unsafe injection.

CONCLUSION

There was high indication of poor injection safety among PHCWs in Ilorin, Nigeria which was characterized by high rate of needle recapping, poor sharp waste disposal and non availability of injection equipments. The Needle stick Injury (NSI) was moderately high and majority of these injuries went unaccounted for by the health authority.

AKNOWLEDGEMENT

We wish to acknowledge John Snow Incorporated / Making Medical Injection Safer (JSI/MMIS) in Nigeria, for the immense support and provision of research materials for this study.

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