OCCUPATIONAL BLOOD AND BODY FLUID EXPOSURE AMONGST MEDICAL INTERNS IN GAUTENG

Sunday J Aigbodion

Student No. 1785292

A Research Report submitted to the Faculty of Health of the University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Emergency Medicine

23-07- 2019

DECLARATION

I, Sunday Aigbodion, hereby declare that this research report is my own work and has not been submitted or presented for any other degree or professional qualification at this or any other Institute. This research was undertaken in the Division of Emergency Medicine, University of the Witwatersrand, Johannesburg.

Signature of Student:________________________ Date: 23/07/2019

Name of Supervisor 1: Prof A Laher

Signature of Supervisor 1:________________________ Date: 23/07/2019

Name of Supervisor 2: Prof F Motara

Signature of Supervisor 2:________________________ Date: 23/07/2019

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to:

My family for their ongoing support and encouragement.

My supervisors, Prof Abdullah Ebrahim Laher and Prof Feroza Motara for their continual assistance, time, patience, dedication, motivation and guidance.

SUBMISSION FORMAT OF THIS RESEARCH REPORT

As per University of the Witwatersrand Faculty of Health Sciences guidelines, this research report is being submitted in the following format: article published in an accredited journal.

The publication that emanated for this research project entitled "**Occupational blood and body fluid exposures and human immunodeficiency virus post-exposure prophylaxis amongst intern doctors**" was published in the *South African Journal of HIV Medicine* on 22 May 2019 – Aigbodion SJ, Motara F, Laher AE. Occupational blood and body fluid exposures and human immunodeficiency virus post-exposure prophylaxis amongst intern doctors. South Afr J HIV Med 2019;20(1). https://doi.org/:10.4102/sajhivmed.v20i1.958. The journal is indexed in various databases including PubMed Central, Web of Science (Impact Factor: 1.37) and Scopus (CiteScore 0.82).

TABLE OF CONTENTS

PUBLISHED MANUSCRIPT

TYPE OF ARTICLE

Original research

TITLE OF MANUSCRIPT

Occupational blood and body fluid exposures and human immunodeficiency virus post-exposure prophylaxis amongst intern doctors

RUNNING TITLE

Occupational blood and body fluid exposure amongst interns

AUTHORS

Sunday J AIGBODION[1]; MBBS, DO, DGP, DipOHS; sundayj4god@gmail.com

Feroza MOTARA[1]; BA, MBBCh, MFam Med, FCFP, ACEM, DipHIVMan; feroza.motara@wits.ac.za

Abdullah E LAHER[1]; MBBCh, MMed, FCEM, Cert Critical Care, EDIC, DipPEC, DCH, DipAllerg, DipHIVMan; abdullahlaher@msn.com

[1]Department of Emergency Medicine, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

CORRESPONDING AUTHOR

Professor Abdullah Laher, Department of Emergency Medicine, Faculty of Health Sciences, University of the Witwatersrand, 7 Jubilee Road, Parktown, Johannesburg, 2193, South Africa. E mail abdullahlaher@msn.com; telephone: +27848402508

WORD, FIGURE AND TABLE COUNTS

Abstract: 273

Manuscript: 2585

Figures: 1

Tables: 2

SUBMISSION LETTER TO THE EDITOR

Dear Editor- The South African Journal of HIV Medicine:

Thank you for considering our article entitled: “Occupational blood and body fluid exposures and human immunodeficiency virus post-exposure prophylaxis amongst intern doctors”. The occurrence of occupational blood and body fluid exposures (OBBFE) among healthcare providers (HCPs) is well documented. Complications following OBBFE include HIV and Hepatitis seroconversion. Apart from the therapy required in its management, OBBFE also carries a medico-legal liability in cases of delay, omission or neglect.

The burden of occupational OBBFE is well documented in developed countries. The incidence among medical interns in South African is poorly documented. This includes the incidence, risk factors, post exposure prophylaxis guidelines, compliance and common characteristics among medical interns that are exposed to OBBFE’s.

We are certain that this article will appeal to the readership of the HIV medical Journal. [1] Furthermore, it carries a high citation potential, as it is applicable to those in the fields of General Medicine, Emergency Medicine, Trauma, Infectious Diseases, HIV Medicine as well as hospital managers

ABSTRACT

Background: Healthcare workers (HCWs) are constantly vulnerable to occupational blood and body fluid exposures (OBBFEs). Exposed HCWs experience emotional, physical and psychological trauma. Less experienced HCWs, such as intern doctors, are more prone to OBBFEs.

Objectives: The aim of this study was to investigate the prevalence and practices pertaining to OBBFEs amongst a select group of intern doctors in the Gauteng province of South Africa.

Methods: A quantitative cross-sectional descriptive study using a questionnaire based on a practical model was used. Intern doctors were recruited from four major hospitals in Gauteng.

Results: A total of 175 intern doctors participated in the study. There was a total of 182 (mean = 1.04, standard deviation [s.d] 0.88) reported OBBFEs amongst 136 (77.7%) subjects. The exposures occurred predominantly whilst subjects were working in surgery (n = 50, 27.5%), obstetrics and gynaecology (n = 49, 26.9%) and internal medicine (n = 48, 26.4%) departments; were superficial wounds (n = 69, 37.9%); were acquired during vascular puncture or intravenous line insertion (n = 69, 37.9%); and occurred when subjects were working >12 h shifts (n = 101, 55.5%). Human immunodeficiency virus (HIV) post-exposure prophylaxis (PEP) was initiated in 141 (77.5%) out of the 182 exposures. Only 90 (63.8%) subjects completed the recommended 28-day course of PEP. Two (1.1%) subjects reported that they had acquired HIV infection as a consequence of the OBBFE.

Conclusion: Occupational blood and body fluid exposures are common amongst intern doctors. It is recommended that regular training, health education and monitoring compliance should be incorporated during the induction of medical intern doctors in hospitals. The availability of PEP regimens with better tolerability will encourage compliance.

Keywords: Occupational blood and body fluid exposure; Needle stick injury; Intern doctors; Post-exposure prophylaxis; Healthcare workers

INTRODUCTION

Medical doctors, especially intern doctors who are the most junior doctors employed at hospitals, face the threat of occupational blood and body fluid exposure (OBBFE) with the consequent risk of acquiring blood-borne infections (BBIs) by pathogens such as the human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV).[1]

Significant occupational exposure to blood and other infectious body fluids is defined as (1) percutaneous exposures resulting in a breach to the skin by a human bite or a contaminated needle, blade, lancet or other sharp objects; (2) mucocutaneous exposure which includes splashes to mucosal surfaces such as the nose, mouth or eyes; and (3) non-intact skin exposure which includes dermatitis, chapped skin, abrasions and open wounds. Potentially infectious body fluids include blood, tissue, semen, vaginal secretions, visibly bloody fluids as well as cerebrospinal, pleural, pericardial, synovial and amniotic fluids.[2]

Previous studies predominantly reported on OBBFEs or needle stick injuries (NSIs) amongst healthcare workers (HCW) in general.[3,4,5] However, more recent studies have recognised the necessity of the frequent education of intern doctors concerning blood and body fluid exposures.[6] Therefore, the rationale for this study was prompted by the lack of studies directed specifically at intern doctors. We hypothesised that intern doctors, because of their lack of experience, high workload and long working shifts,[7] are more prone to OBBFEs. The aim of this study was to determine the prevalence, risk factors, adherence to post-exposure prophylaxis (PEP) guidelines and compliance with PEP amongst intern doctors.

METHODS

A quantitative cross-sectional descriptive study using a questionnaire based on a practice model was used. The study population comprised intern doctors employed at four different hospitals (Charlotte Maxeke Johannesburg Academic Hospital, Chris Hani Baragwanath Academic Hospital, Far East Rand Hospital and Thelle Mogoerane Hospital) in the Gauteng province of South Africa. The former two hospitals are tertiary academic hospitals based in central and southern Gauteng, respectively, whereas the latter two hospitals are secondary level regional hospitals based in the east of Gauteng. All four hospitals are affiliated with the University of the Witwatersrand.

Data collection was commenced soon after protocol approval and ethical clearance (University of the Witwatersrand, certificate no. M170496) were obtained. Data collection was conducted between 13 September and 19 December 2017. As the 2-year medical internship programme in South Africa generally commences on 01 January every year, it was assumed that all study participants had at least 8 months of working experience at the time of data collection. The first part of the questionnaires aimed to determine gender, age, experience, significant blood or body fluids exposures, reporting of these exposures and awareness of PEP protocols. The second part of the questionnaire was based on details of OBBFEs and actions taken after each exposure.

The primary researcher attended unit meetings at various clinical departments of the included hospitals where intern doctors were working. Participant information and informed consent sheets as well as questionnaires that were placed in an anonymous envelope were distributed to the intern doctors who were requested to voluntarily participate in the study. Completed questionnaires were placed back in the envelopes and collected immediately thereafter. Confidentiality and anonymity of the participants were maintained throughout the study.

Data were captured in an Excel spreadsheet (Microsoft® Excel® 2010) and imported into Stata version 14 (StataCorp® 2015, College Station, TX) statistical software for analysis.

Data were described and categorical variables were expressed as frequencies and percentages. The prevalence of blood and body fluid exposures was calculated. Clinical and sociodemographic characteristics of the participants were compared between those who were exposed and those who were not exposed to OBBFEs as defined in the questionnaire. Pearson's chi-squared test and Fisher's exact test were utilised to determine significant differences. The level of statistical significance was set at $p < 0.05$.

ETHICAL CONSIDERATION

Ethical approval for this study was obtained from the University of Witwatersrand Human Research Ethics Committee (certificate no. M170496).

RESULTS

A total of 212 questionnaires were administered, of which 175 were returned, giving a response rate of 82.5%. Out of the 175 subjects who completed the questionnaire, there was a total of 182 (mean = 1.04, standard deviation [s.d.] 0.88) reported OBBFEs amongst 136 (77.7%) subjects. Of these 136 subjects, 106 (77.9%) had one exposure, 21 (15.4%) had two exposures, 4 (2.9%) had three exposures, 3 (2.2%) had four exposures and 2 (1.5%) had five exposures. Therefore, a total of 30 (22.1%) subjects had reported more than one OBBFE.

Table 1 describes and compares gender, age group, work experience as well as the familiarity and user-friendliness with institutional OBBFE protocols and policies between subjects who had and those who had not experienced an OBBFE. Overall, there were marginally more female (n = 97, 55.4%) than male subjects, with almost all subjects being between 24 and 30 years of age (n = 170, 97.1%). The majority of subjects (n = 124, 70.9%) were working in their second year of medical internship. Only 40% of subjects (n = 70) reported that they were fully familiar with institutional OBBFE protocols/policies and 126 (72.0%) believed that these protocols/policies were user-friendly (n = 126, 72.0%). The majority of subjects were aware of where to report an OBBFE (n = 145, 82.8%) and were also aware of where to acquire the antiretroviral therapy starter pack after an exposure (n = 148, 84.6%). There were no statistically significant differences between those who had and those who had not experienced an OBBFE.

TABLE 1: Description and comparison of gender, age group, work experience as well as the familiarity and user-friendliness with institutional occupational blood and body fluid exposure protocols/policies between subjects who had and those who had not experienced an occupational blood and body fluid exposure.

Variables	**Experienced OBBFE (n=136)**	**Did not experience OBBFE (n= 39)**	**P***
Gender			
Male (n=78, 44.6%)	57 (41.9%)	21 (53.8%)	p=0.186
Female (n=97, 55.4%)	79 (58.1%)	18 (46.2%)	
Age group (years)			
24-30 (n=170, 97.1%)	134 (98.5%)	36 (92.3%)	p=0.059
31-40 (n=3, 1.7%)	1 (0.7%)	2 (5.1%)	
>40 (n=2, 1.1%)	1 (0.7%)	1 (2.6%)	
Work experience			
≤12 months (n=51, 9.1%)	37 (27.2%)	14 (35.9%)	p=0.292
>12 months (n=124, 70.9%)	99 (72.8%)	25 (64.1%)	
Familiarity with institutional OBBFE protocol/policy			
Fully familiar (n=70, 40.0%)	54 (39.7%)	16 (41.0%)	p=0.065
Partially familiar (n=103, 58.9%)	82 (60.3%)	21 (53.8%)	
Did not know that these exist (n=2, 1.1%)	0 (0.0%)	2 (5.1%)	
User friendliness of institutional OBBFE protocol/policy			
Yes (n=126, 72.0%)	96 (70.6%)	30 (76.9%)	p=0.806
No (n=27, 15.4%)	22 (16.2%)	5 (12.8%)	
I don't know (n=22, 12.6%)	18 (13.1%)	4 (10.3%)	

OBBFE, occupational blood and body fluid exposure.
*Statistical significance ($p < 0.05$).

The majority of exposures occurred whilst working in surgery (n = 50, 27.5%), obstetrics and gynaecology (n = 49, 26.9%) and internal medicine (n = 48, 26.4%) departments, with superficial wounds (no blood seen) being the most common wound type (n = 69, 37.9%). The majority of exposures were acquired during vascular puncture and/or intravenous line insertion (n = 69, 37.9%) and occurred when subjects were working > 12 h shifts (n = 101, 55.5%). More than three-quarter of exposures were reported within 24 h of the incident (n =

152, 83.5%). Only 149 (81.9%) subjects had a follow-up blood test done after the exposure (see Table 2).

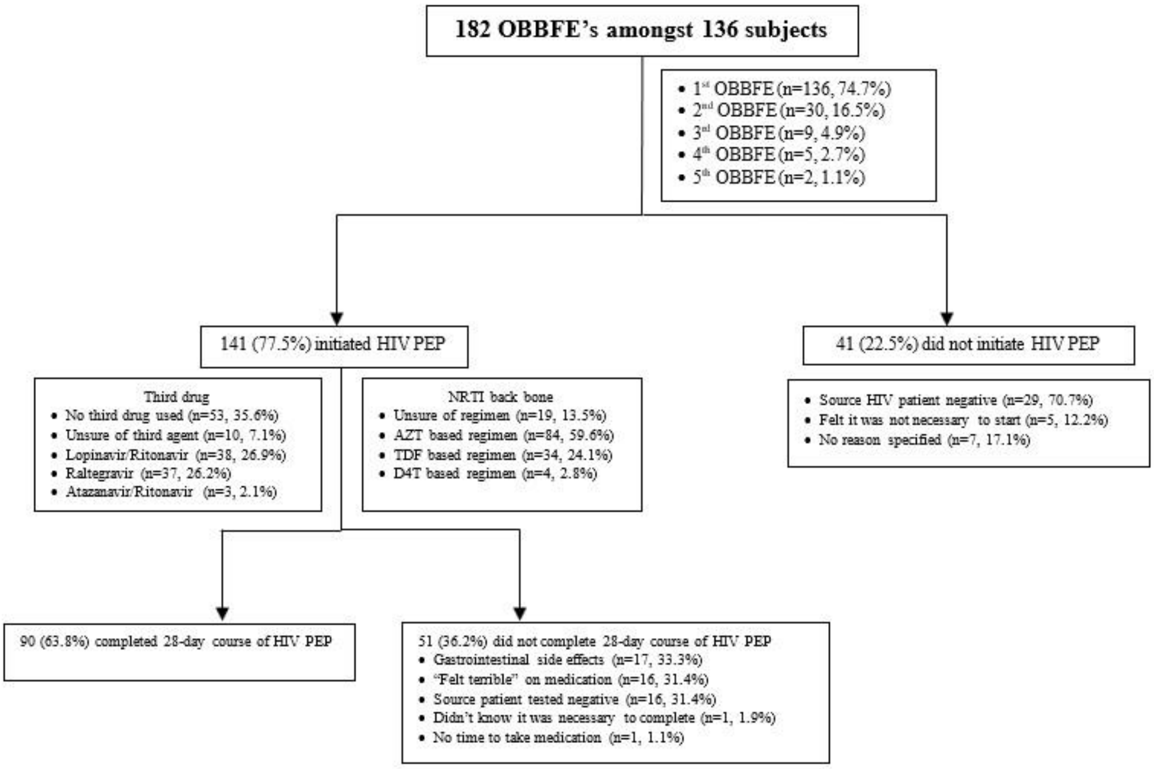
Two (1.1%) subjects reported that they had acquired HIV infection after the exposure. Both of these subjects reported HIV seroconversion on repeat testing within 4 months of the exposure. Both subjects were men between the ages of 24 and 30 years, were working in their second year of medical internship, sustained a deep needle stick injury to their finger, reported the incident within 24 h, initiated and completed the 28-day two-drug regimen of antiretroviral therapy, did not use a third antiretroviral agent and were wearing gloves. The first subject sustained his injury from a hollow bore needle whilst inserting an intravenous line, whilst the second subject sustained his injury from a suturing needle whilst inserting an intercostal drain. Unfortunately, the questionnaire did not enquire whether participants engaged in risky sexual behaviour around the time of the exposure.

Initiation of antiretroviral therapy, drug regimens used and compliance with HIV PEP are described in Figure 1. Overall, HIV PEP was initiated in 141 (77.5%) out of the 182 exposures. However, the recommended 28-day course of therapy was only completed in 90 (63.8%) out of the 141 cases where PEP was initiated.

TABLE 2: Description of the 182 occupational blood or body fluid exposures amongst study subjects.

Variables	**n (%)**
Department where exposure occurred	
Surgery	50 (27.5%)
Obstetrics & Gynaecology	49 (26.9%)
Internal Medicine	48 (26.4%)
Emergency Department	21 (11.6%)
Paediatrics	8 (4.4%)
Orthopaedics	3 (1.6%)
Anaesthesia	3 (1.6%)
Psychiatry	0 (0.0%)
Use of personal protective equipment (PPE) during exposure	
Gloves	177 (97.3%)
Goggles	30 (16.5%)
Facemask	26 (14.3%)
Plastic apron	20 (10.9%)
Procedure being performed or aetiology of exposure	
Vascular puncture / intravenous line insertion	69 (37.9%)
Wound suturing	43 (23.7%)
Assisting in surgical procedures	21 (11.6%)
Putting up a chest drain	11 (6.0%)
Recapping used needles	11 (6.0%)
Overfilled sharps container	11 (6.0%)
Putting blood into specimen bottle	10 (5.5%)
Amniotic fluid splash	6 (3.3%)
Nature of exposure	
Superficial wound (blood not seen)	69 (37.9%)
Deep wound (blood seen)	63 (34.6%)
Mucocutaneous exposure	38 (20.9%)
Non-intact skin exposure	12 (6.6%)
Action taken after exposure	
Follow each step of local policy	87 (47.8%)
Wash exposure area and or replace gloves and continue	73 (40.1%)
Ignore and continue	22 (12.1%)
Circumstances around exposure	
Working shift >12 hours	101 (55.5%)
Tiredness / fatigue	37 (20.2%)
Working without supervision	19 (10.4%)
Poor instruments	16 (8.8%)
No assistant present	7 (3.8%)
Poor lighting	2 (1.1%)
How soon after the incident was the exposure reported	
Within 24 hours	152 (83.5%)
24-48 hours	10 (5.5%)
>72 hours	12 (6.6%)
48-72 hours	6 (3.3%)
Didn't report the incident	2 (1.1%)
Was a follow-up blood test done	
Yes	149 (81.9%)
No	33 (18.1%)
Infection acquired after the exposure	
None	180 (98.9%)
HIV	2 (1.1%)
Hepatitis B or C	0 (0.0%)

Amongst the 136 subjects who had experienced their first exposure, 107 (78.7%) had initiated and 68 (63.6%) had completed the 28-day course of PEP. Amongst the 30 subjects who had experienced their second exposure, 22 (73.3%) had initiated and 14 (63.6%) had completed PEP. Amongst the nine subjects who had experienced their third exposure, eight (88.9%) had initiated and five (62.5%) had completed PEP. Amongst the five subjects who had experienced their fourth exposure, three had initiated and two (66.7%) had completed PEP. Amongst the two subjects who had experienced their fifth exposure, one (50.0%) had initiated and completed PEP.



OBBFE, occupational blood and body fluid exposure; PEP, post-exposure prophylaxis.

FIGURE 1: Initiation, compliance and regimen pertaining to HIV post-exposure prophylaxis amongst study subjects.

More than one-third (n = 51, 36.2%) of subjects who had initiated HIV PEP did not complete the 28-day course of therapy. The most common reasons for not completing the therapy included gastrointestinal side effects (n = 17, 33.3%), the subject 'felt terrible' on medication (n = 16, 31.4%) and the source patient tested negative for HIV (n = 16, 31.4%). The most commonly used PEP regimen was AZT based (n = 84, 59.6%) and at least 53 (35.6%) subjects did not use a third drug. Overall, 33 (18.1%) subjects were not aware of PEP regimens with less side effects.

DISCUSSION

Compared to other studies where the response rate ranged between 42% and 98%,[8,9,10,11,12,13] the overall response rate in this study was 82.5%. Of the 182 OBBFEs, 98.9% were reported to the relevant authorities, with the majority (83.5%) being reported within 24 h of the exposure. A report rate of 77% was found in a study in Montenegro,[14] compared with a lower report rate of 30% amongst medical trainees in East Toronto General Hospital.[8] Kassa et al. in Botswana also found a low report rate of 37%.15 A much lower report rate of 28.9% was found in Ghana.[16] The reason for the higher report rate amongst participants in this study could be attributed to greater awareness because of the high prevalence of HIV in South Africa.[17]

More than three-quarters (77.7%) of study participants had experienced at least one OBBFE. Internationally, the prevalence of NSIs has been reported as between 20.9% and 74%.[3,4,5] In a large meta-analysis that included 16 105 HCWs from 44 studies across Iran, the overall prevalence of NSI was noted as 42.5% (95% CI 37% – 48%).[18] Compared to our study that only included intern doctors, these studies included all HCWs (nurses, doctors, paramedics and laboratory staff). The higher prevalence in our study can be ascribed to the fact that intern doctors are relatively inexperienced, are frequently the first line of patient contact and are often left with the responsibility of performing basic procedures such as insertion of intravenous lines, wound suturing and taking of blood specimens. Also, in this study, most NSIs occurred whilst performing vascular puncture and/or intravenous line insertion or wound suturing (61.6% of cases). Comparatively, recapping used needles was found to be the reason for most NSIs in an Italian study,[19] whereas in Toronto, Canada, Ben Ouyang et al. reported that most NSIs took place whilst performing wound suturing.[8]

There were no significant differences between those who had and those who had not experienced an OBBFE with regard to gender, age group, work experience, familiarity and user-friendliness with institutional OBBFE protocols/policies. However, bearing in mind that South Africa has a high burden of HIV, with approximately one-fifth of the adult population testing positive,[17] it is concerning that more than half of the study participants were not fully familiar with institutional protocols/policies.

Globally, it is estimated that OBBFEs are responsible for approximately 66 000 HBV, 16 000 HCV and 200–5000 HIV infections amongst HCWs annually.[20] The risk of HIV transmission has been estimated as 0.3% after percutaneous exposure and 0.1% after mucocutaneous exposure to HIV infected blood.[21] A meta-analysis that included 5810 patients from 22 studies reported a pooled infectivity estimate of 0.23% (95% CI: 0.00–0.46), with 15 of these studies reporting a transmission risk of 0%.[22] Comparatively, the seroconversion rate was four- to fivefold higher in this study (n = 2, 1.1%). Both the subjects had completed the 28-day PEP regimen. However, a two-drug and not a three-drug regimen was prescribed in both cases. Although most PEP guidelines recommend a three-drug regimen, there is no evidence to suggest that a three or more drug regimen is superior to a two-drug regimen.[23]

More than half (55.5%) of the OBBFEs in this study occurred when subjects were working shifts of > 12 h, with 20.2% of subjects reporting tiredness and fatigue as a contributory factor. These findings are in line with the findings of a large systematic review that included

65 studies from 21 African countries. The authors concluded that a lack of training and working more than 40 h per week were risk factors for acquiring an OBBFE.[24]

A long-standing tradition in healthcare institutions is strict adherence and advocacy for the use of personal protective equipment (PPE) to minimise contact with blood and body fluids. Such measures include, but are not restricted to, the use of gloves, goggles and aprons. Most of the participants in this study used gloves (97.3%), which is considerably higher than the findings of other studies that reported figures of 89%12 and 52%.[25]

Poor adherence to standard PEP protocols has been associated with a high risk of seroconversion to HIV and other pathogens.[26,27] One study reported that 45% of HCWs did not use PEP after an OBBFE, whilst 50% in the same study had to purchase the PEP themselves.[28] This research study reported initiation of PEP amongst 77.5% of exposed respondents, which is suboptimal in a setting where HIV is endemic. Reasons for the suboptimal initiation of PEP include a lack of insight as well as a lack of strict enforcement and education regarding PEP protocols.[27,29] Following education and implementation of institutional protocols, PEP uptake was observed to have a trajectory increase from 12% to 90% in a study by Peponis et al.[27]

This study revealed a PEP completion rate of 63.8% as compared to 79% recorded by Kassa et al.[15] Established reasons for non-completion of PEP include fatigue, gastrointestinal side effects and drug rash, amongst others.[30] Amongst the 77.5% of subjects who started PEP, 36.2% did not complete the course, predominantly because of poor tolerability of drug side effects. In light of this discussion, we strongly recommend that there should be psychological, social and emotional supports to exposed HCWs who are using PEP.

Of further concern is that 18.1% of subjects were unaware of alternate PEP regimens with better tolerability. The World Health Organization advocates the use of PEP regimens containing a third drug with improved tolerability and higher associated completion rates (e.g. dolutegravir, duranvir and raltegravir).[31] Because of cost implications, these newer and more tolerable drug regimens have only recently been made available in some public sector hospitals in South Africa (pers. comm. with National Department of Health personnel). Even though these regimens are more expensive, their higher cost cannot be compared to the cost of reduced tolerability, which may lead to days off and the risk of acquiring HIV associated with not completing the entire 28-day course of PEP.[27] Widespread availability of these newer PEP regimens in public hospitals would go a long way in ensuring PEP completion.

In summary, this study highlights the high prevalence of OBBFEs amongst intern doctors. We strongly advocate for better working hours for junior doctors, the widespread availability of triple drug PEP regimens with more tolerable side effect profiles and strict adherence to approved institutional guidelines. We also recommend the implementation of targeted educational programmes and the training of junior HCWs on local policies and guidelines relating to OBBFEs. Furthermore, healthcare institutions in conjunction with the National Department of Health should ensure that these strategies comply with locally and internationally acceptable standards and recommendations.

LIMITATIONS

This is a regional study that was conducted in four hospitals in Gauteng province. Hence, the findings may not be representative of other regions in South Africa. Furthermore, other limitations that are associated with questionnaire-based studies also apply here, which include recall bias and selective non-disclosure.

CONCLUSION

Occupational blood and body fluid exposures are common amongst intern doctors. It is recommended that regular training, health education and monitoring compliance should be incorporated during the induction of medical internship doctors in hospitals. The availability of PEP regimens with better tolerability will encourage compliance.

ACKNOWLEDGEMENTS

The authors would like to thank Dr Callistus Enyuma for his assistance with analysis of the data.

Competing interests

The authors declare that this article is not under publication consideration elsewhere and that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

S.J.A was the primary author and was responsible for the study design, data collection, data analysis, manuscript write-up and approval of the final manuscript. F.M. assisted with study design, data analysis, interpretation of results, editing of the manuscript and approval of the final manuscript. A.E.L. assisted with study design, data analysis, interpretation of results, preparation of the manuscript and approval of the final manuscript. He is the corresponding author.

REFERENCES

1. Norsayani MY, Noor Hassim I. Study on incidence of needle stick injury and factors associated with this problem among medical students. J Occup Health. 2003;45(3):172–178. https://doi.org/10.1539/joh.45.172

2. Moorhouse M, Bekker LG, Black V, et al. Guideline on the management of occupational and non-occupational exposure to the human immunodeficiency virus and recommendations for post-exposure prophylaxis: 2015 update. S Afr J HIV Med. 2015;16(1):1–14. https://doi.org/10.4102/sajhivmed.v16i1.399

3. Bhardwaj A, Sivapathasundaram N, Yusof M, Minghat A, Swe K, Sinha N. The prevalence of accidental needle stick injury and their reporting among healthcare workers in orthopaedic wards in General hospital Melaka, Malaysia. Malaysian Orthop J. 2014;8(2):6–13. https://doi.org/10.5704/MOJ.1407.009

4. Khraisat F, Juni M, Salmiah M, Rahman A, Hamdan-Mansour A. Needle stick injuries prevalence among nurses in Jordanian hospitals. Int J Public Health Clin Sci. 2015;2(4):7–16.

5. Cho E, Lee H, Choi M, Park SH, Yoo IY, Aiken LH. Factors associated with needlestick and sharp injuries among hospital nurses: A cross-sectional questionnaire survey. Int J Nurs Stud. 2013;50(8):1025–1032. https://doi.org/10.1016/j.ijnurstu.2012. 07.009

6. Malhotra S, Sharma S, Bhatia N, Hans C. Needle-stick injury among health care workers and its response in a tertiary care hospital. Indian J Med Microbiol. 2016;34(2):258. https://doi.org/10.4103/0255-0857.180368

7. Brown M, Tucker P, Rapport F, et al. The impact of shift patterns on junior doctors' perceptions of fatigue, training, work/life balance and the role of social support. BMJ Qual Saf. 2010;19(6):e36–e36. https://doi.org/10.1136/qshc.2008.030734

8. Ouyang B, Li LD, Mount J, et al. Incidence and characteristics of needlestick injuries among medical trainees at a community teaching hospital: A cross-sectional study. J Occup Health. 2017;59(1):63–73. https://doi.org/10.1539/joh.15-0253-FS

9. Senthil A, Anandh B, Jayachandran P, et al. Perception and prevalence of workrelated health hazards among health care workers in public health facilities in southern India. Int J Occup Environ Health. 2015;21(1):74–81. https://doi.org/1 0.1179/2049396714Y.0000000096

10. Colet PC, Cruz JP, Alotaibi KA, Colet MKA, Islam SMS. Compliance with standard precautions among baccalaureate nursing students in a Saudi university: A self-report study. J Infect Public Health. 2017;10(4):421–430. https://doi.org/ 10.1016/j.jiph.2016.06.005

11. Nophale LE. Reported needle stick injuries amongst health care workers in regional hospitals in the Free State Province. Bloemfontein: University of the Free State; 2009.

12. Haile TG, Engeda EH, Abdo AA. Compliance with standard precautions and associated factors among healthcare workers in Gondar University Comprehensive Specialized Hospital, Northwest Ethiopia. J Environ Public Health. 2017;2017:1–8. https://doi.org/10.1155/2017/2050635

13. Ndejjo R, Musinguzi G, Yu X, et al. Occupational health hazards among healthcare workers in Kampala, Uganda. J Environ Public Health. 2015;2015:1–16. https:// doi.org/10.1155/2015/913741

14. Cjevanov-Kezunović L, Mustajbegović J, Milosevic M, Čivljak R. Occupational exposure to blood among hospital workers in Montenegro. Arch Ind Hyg Toxicol. 2014;65(3):273–280. https://doi.org/10.2478/10004-1254-65-2014-2493

15. Kassa G, Selenic D, Lahuerta M, et al. Occupational exposure to bloodborne pathogens among health care workers in Botswana: Reporting and utilization of postexposure prophylaxis. Am J Infect Control. 2016;44(8):879–885. https://doi. org/10.1016/j.ajic.2016.01.027

16. Lori JR, McCullagh MC, Krueger A, Oteng R. Sharps injuries among emergency department nurses in one tertiary care hospital in Ghana. Int Emerg Nurs. 2016;28:14–19. https://doi.org/10.1016/j.ienj.2015.11.007

17. Shisan O, Rehle T, Simbayi L., et al. South African National HIV prevalence, incidence and behaviour survey, 2012. Cape Town: HSRC Press; 2014.

18. Ghanei Gheshlagh R, Aslani M, Shabani F, Dalvand S, Parizad N. Prevalence of needlestick and sharps injuries in the healthcare workers of Iranian hospitals: An updated meta-analysis. Environ Health Prev Med. 2018;23(1):44. https://doi. org/10.1186/s12199-018-0734-z

19. Motaarefi H, Mahmoudi H, Mohammadi E, Hasanpour-Dehkordi A. Factors associated with needlestick injuries in health care occupations: A systematic review. J Clin Diagn Res. 2016;10(8):IE01–IE04. https://doi.org/10.7860/JCDR/ 2016/17973.8221

20. World Health Organization. Sharps injuries: Global burden of disease from sharps injuries to health-care workers [homepage on the Internet]. [cited 2019 Feb 7]. Available from: https://www.who.int/quantifying_ehimpacts/ publications/9241562463/en/.

21. HIV post-exposure prophylaxis: Guidance from the UK Chief Medical Officers' Expert Advisory Group on AIDS [homepage on the Internet]. c2008 [cited 2019 Feb 7]. Available from: https://webarchive.nationalarchives.gov. uk/20130105025754/http://www.dh.gov.uk/en/Publicationsandstatistics/ Publications/PublicationsPolicyAndGuidance/DH_088185?ssSourceSiteId=ab.

22. Baggaley RF, Boily M-C, White RG, Alary M. Risk of HIV-1 transmission for parenteral exposure and blood transfusion: A systematic review and meta-analysis. AIDS. 2006;20(6):805–812. https://doi.org/10.1097/01.aids.0000218543.46963.6d

23. Kumar T, Sampsel K, Stiell IG. Two, three, and four-drug regimens for HIV postexposure prophylaxis in a North American sexual assault victim population. Am J Emerg Med. 2017;35(12):1798–1803. https://doi.org/10.1016/j.ajem. 2017.05.054

24. Auta A, Adewuyi EO, Tor-Anyiin A, et al. Health-care workers' occupational exposures to body fluids in 21 countries in Africa: Systematic review and metaanalysis. Bull World Health Organ. 2017;95(12):831–841F. https://doi.org/ 10.2471/BLT.17.195735

25. Nugmanova Z, Patel N, Nurbakhyt A, et al. Universal precautions in Central Asia: The need for multiple strategies in this window of opportunity. J Hosp Infect. 2015;89(3):197–201. https://doi.org/10.1016/j.jhin.2014.11.011

26. Guilbert JJ. The world health report 2002: Reducing risks, promoting healthy life. Educ Heal. 2003;16(2):230. https://doi.org/10.1080/1357628031000116808

27. Peponis T, Cropano MC, Larentzakis A, et al. Trauma team utilization of universal precautions: If you see something, say something. Eur J Trauma Emerg Surg. 2017;43(1):145–150. https://doi.org/10.1007/s00068-016-0663-8

28. Bekele T, Gebremariam A, Kaso M, Ahmed K. Attitude, reporting behavour and management practice of occupational needle stick and sharps injuries among hospital healthcare workers in Bale zone, Southeast Ethiopia: A cross-sectional study. J Occup Med Toxicol. 2015;10(1):e1–e7. https://doi.org/10.1186/s12995015-0085-2

29. Bodkin C, Bruce J. Health professionals' knowledge of prevention strategies and protocol following percutaneous injury. Curationis. 2003;26(4):22–28. https://doi. org/10.4102/curationis.v26i4.868

30. Dia A, Verret C, Pommier de Santi V, et al. Blood and body fluid exposures in the French military. Occup Med (Chic Ill). 2012;62(2):141–144. https://doi. org/10.1093/occmed/kqr179

31. WHO: Updated recommendations on first-line and second-line antiretroviral regimens and post-exposure prophylaxis and recommendations on early infant diagnosis of HIV: Interim guidelines [homepage on the Internet]. [cited 2019 Jan 16]. Available from: https://apps.who.int/iris/bitstream/handle/10665/277395/ WHO-CDS-HIV-18.51-eng.pdf?ua=1.

RESEARCH PROTOCOL

Occupational blood and body fluid exposure amongst medical interns in Gauteng

Research protocol in partial fulfilment for the degree in Master of Science in Medicine (Emergency Medicine)

Dr Sunday Joseph Aigbodion, 1785292

Supervisors: Prof Abdullah Laher

Prof Feroza Motara

INTRODUCTION

Medical doctors, especially interns, face the threat of occupational blood and body fluid exposure with the consequent risk of acquiring blood born infections by pathogens such as human immunodeficiency virus (HIV), hepatitis B Virus (HBV) and hepatitis C virus (HCV) while performing their duties.[1] Significant occupational exposure to blood and other infectious body fluids is defined as 1) percutaneous exposures resulting in breaking of the skin by a needle, blade, lancet, human bite or any other sharp object; 2) mucocutaneous exposure which includes splashes to mucosal surfaces such as the nose, mouth or eyes and 3) non-intact skin contamination which include dermatitis, chapped skin, abrasions and open wounds. Potentially infectious body fluids include blood, tissue, semen, vaginal secretions as well as cerebrospinal, pleural, pericardial, synovial, pericardial, amniotic and other visibly bloody fluids.[2] The National Institute of Occupational Safety and Health (NIOSH) in the United States of America defines needle stick injuries (NSI's) as injuries caused by needles such as hypodermic needles, blood collection needles, intravenous stylets, and needles used to an intravenous delivery system.[3]

Of greater significance is the transmission of HIV. The HIV epidemic remains one of the greatest health and development challenges facing sub-Saharan Africa. South Africa bears a substantial brunt of the HIV epidemic, with 6.4 million adults and children living with HIV.[4] Hence the need to assess awareness, preventive measures and adherence to national department of health protocols with regards to significant occupational exposures.

In a survey of risk of exposures among surgeons in sub-Saharan Africa by Phillips et al., surgeons sustained a mean of 3.1 percutaneous injuries. Fewer than half of these respondents reported completion of hepatitis B vaccination, while post exposure prophylaxis for HIV was widely utilized.[5]

Bodkin and Bruce showed that only 26.4% (n=42) of subjects in their study could accurately quote the South African Institute of Medical Research (SAIMR) protocol procedure following a percutaneous injury, implying a lack of knowledge of standard preventive protocols by health care professionals. They also reported that only 53.8% of health care professionals reported the injury.[6]

In 1996 there were 56 documented and 138 possible cases of occupationally acquired HIV infections reported to the Centers for Disease Control and Prevention (CDC).[7] The estimated risk of acquiring HIV after a percutaneous or mucous membrane exposure from an HIV-infected patient has been estimated as 0.3% and 0.09% respectively.[8]

Jagger et al clearly identified characteristics of devices associated with NSI's in a university hospital over a 10-month period. Of 326 injuries studied, disposable syringes accounted for

35 percent, intravenous tubing and needle assemblies for 26 percent, prefilled cartridge syringes for 12 percent, winged steel-needle intravenous sets for 7 percent, phlebotomy needles for 5 percent, intravenous catheter stylets for 2 percent, and other devices for 13 percent. Devices that required disassembly had rates of injury of up to 5.3 times the rate of disposable syringes.[8]

The application and adherence to national safety protocols has been shown to reduce the rates of infection transmission and seroconversion. Similarly, the use of gloves has been shown to reduce the transferred blood volume by 46%–86%.[9] Awareness of availability and accessibility to post exposure prophylaxis (PEP) needs to be strengthened. Although it was shown in a study in Goa medical college in India where all doctors (100%) were aware of PEP for HIV,[10] a study in Delhi reported that 62.8% of doctors were not aware of PEP for HIV.[11] In a recent study, the most frequent clinical side effect in health care workers (HCW) related to PEP was fatigue (88.5%), and gastroenterological symptoms. More than a third of subjects (38.5%) presented features of liver dysfunction, while drug rash was found in 69.2% of those receiving PEP. There were higher rates of side effects amongst health care workers receiving PEP than in HIV/AIDS patients receiving antiretroviral therapy.[12]

STUDY AIM

To conduct an audit of occupational blood and body fluid exposures and compliance with post exposure prophylaxis among medical interns

STUDY OBJECTIVES

- To determine the prevalence of significant blood and body fluid exposures amongst medical interns.

- To describe and compare gender, age, gender, age group, work experience as well as the familiarity and user-friendliness with institutional protocols / policies between subjects that had and had not experienced a significant blood or body fluid exposure.
- To describe events relating to significant blood or body fluid exposures amongst subjects that had experienced a significant blood or body fluid exposure.
- To describe the use and compliance with HIV post exposure prophylaxis amongst study subjects

METHODOLOGY

Study design

Cross-sectional study using a questionnaire based on a practice model (appendix 1).

Study population and sites

The study population will comprise doctors in their first and second year of internship working at the Charlotte Maxeke Johannesburg Academic Hospital (CMJAH), Chris Hani Baragwanath Academic Hospital (CHBAH), Far East Rand Hospital (FERH) and Thele Mogoerane Hospital.

Inclusion criteria

Medical interns employed at the above-named hospitals

Sample size

An attempt will be made to enroll between 150-200 medical interns from the above hospitals. These hospitals currently employ approximately 250 medical interns. If the target cannot be achieved with these hospitals, the study will be expanded to other hospitals once permission is achieved.

Data collection

- Data collection will commence once the protocol has been approved and ethical clearance obtained.

- The primary researcher will attend at various clinical departments of the included hospital where medical interns are working at times that will not interfere with the researchers or interns clinical work responsibilities.
- Participant information and informed consent sheets as well as questionnaires that will be placed in an anonymous envelope will be distributed to the medical interns.
- Medical interns will be requested to voluntarily participate in the study.
- Completed questionnaires will be placed back in the envelopes and collected immediately thereafter.
- Participant confidentiality and anonymity will be maintained throughout the study.

DATA ANALYSIS

All data recorded in the data sheets will be entered into an electronic data spread sheet for analysis (Microsoft® Excel®). STATA ® version13 software will be used to perform all statistical analyses. A descriptive analysis of the data will be presented. Categorical variables will be expressed as frequencies and percentages. The prevalence of blood and body fluid exposures will be calculated. Clinical and socio-demographic characteristics of the participants will be compared between subjects that were exposed and those that were not exposed to blood or body fluids as defined in the questionnaire. The Pearson's chi-squared test and Fisher's exact test will be utilised to determine for significant differences. The level of statistical significance will be set at P-value <0.05.

ETHICS AND PERMISSION

Ethical approval for this study will be obtained from the University of Witwatersrand Human Research Ethics Committee. Permission to conduct the study will be obtained from the CEO of the relevant hospitals. Informed consent will be obtained in writing once the information sheet has been read.

TIMING

Expected timelines are tabulated below.

	Feb 2017	Mar	Apr	May -Jul	Aug -Nov	Dec -Jan	Feb 2018	Mar	Apr
Literature review									
Preparing protocol									
Protocol submission									
Protocol assessment									
Ethics clearance									
Data collection									
Data analysis									
Writing up: report									
Report submission:									
Publication									

FUNDING

The research project will be self-funded with an estimated cost as follows:

Stationary and printing R2000

Travel expenses (petrol and e-toll): R2000

Phone calls to doctors and supervisors: R1000

Total cost: R5000.

PROBLEMS AND LIMITATIONS

This project is expected to progress uneventfully, however incomplete questionnaires may limit data collection. Since most of the questions will be in a “cross the appropriate response” format, this is not considered a major limitation in this study.

REFERENCES

1. Norsayani MY, Noor Hassim I. Study on Incidence of Needle Stick Injury and Factors Associated with this Problem among Medical Students. *J Occup Health*. 2003;45(3):172-178. doi:10.1539/joh.45.172
2. Moorhouse M, Bekker LG, Black V, et al. Guideline on the management of occupational and non-occupational exposure to the human immunodeficiency virus and recommendations for post-exposure prophylaxis: 2015 Update. *South Afr J HIV Med*. 2015;16(1):1-14. doi:10.4102/sajhivmed.v16i1.399
3. CDC - Preventing Needlestick Injuries in Health Care Settings. https://www.cdc.gov/niosh/docs/2000-108/pdfs/2000-108.pdf. Published 1999. Accessed March 9, 2017.
4. Shisana, O, Rehle, T, Simbayi LC, Zuma, K, Jooste, S, Zungu N, Labadarios D, Onoya D et al. *South African National HIV Prevalence, Incidence and Behaviour Survey, 2012*. Cape Town: HSRC press; 2014.
5. Phillips EK, Owusu-Ofori A, Jagger J. Bloodborne Pathogen Exposure Risk Among Surgeons in Sub-Saharan Africa. *Infect Control Hosp Epidemiol*. 2007;28(12):1334-1336. doi:10.1086/522681
6. Bodkin C, Bruce J. Health professionals’ knowledge of prevention strategies and protocol following percutaneous injury. *Curationis*. 2003;26(4):22-28. http://www.ncbi.nlm.nih.gov/pubmed/15027275. Accessed March 9, 2017.
7. *CDC - HIV/AIDS Surveillance Report*. Vol 12.; 2000.

https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2000-vol-12-1.pdf. Accessed March 9, 2017.

8. Jagger J, Hunt EH, Brand-Elnaggar J, Pearson RD. Rates of Needle-Stick Injury Caused by Various Devices in a University Hospital. *N Engl J Med*. 1988;319(5):284-288. doi:10.1056/NEJM198808043190506

9. Mast ST, Woolwine JD, Gerberding JL. Efficacy of gloves in reducing blood volumes transferred during simulated needlestick injury. *J Infect Dis*. 1993;168(6):1589-1592.

10. Salelkar S, Motghare DD, Kulkarni MS, Vaz FS. Study of needle stick injuries among health care workers at a tertiary care hospital. *Indian J Public Health*. 2010;54(1):18-20. doi:10.4103/0019-557X.70540

11. Wig N. HIV: Awareness of management of occupational exposure in health care workers. *Indian J Med Sci*. 2003;57(5):192-198.

12. Cai J, Xiao J, Zhang Q. Side effects and tolerability of post-exposure prophylaxis with zidovudine, lamivudine, and lopinavir/ritonavir: a comparative study with HIV/AIDS patients. *Chin Med J (Engl)*. 2014;127(14):2632-2636.

APPENDIX 1: QUESTIONNAIRE / DATA COLLECTION SHEET

Please cross the appropriate response

Male / Female   Age (years): 1) 24-30 / 2) 31-40 / 3) >40

Occupational blood and body fluid exposure amongst medical interns in Gauteng questionnaire

Please note the following:

Significant occupational exposure to blood and other infectious body fluids is include
1) Percutaneous exposures resulting in breaking of the skin by a needle, blade, lancet, human bite or any other sharp object.
2) Mucocutaneous exposure which includes splashes to mucosal surfaces such as the nose, mouth or eyes.
3) Non-intact skin contamination which include dermatitis, chapped skin, abrasions and open wounds.
Potentially infectious body fluids include blood, tissue, semen, vaginal secretions, cerebrospinal, pleural, pericardial, synovial, pericardial and amniotic and other visibly bloody fluids

Part 1

No	QUESTION	Response
1	What is your work experience as a medical intern?	1) ≤ 12 months 2) > 12 months
2	Have you ever experienced an occupational blood or body fluid exposure (as defined above)?	1) Yes (If Yes please complete part 2 also) 2) No
3	Are you aware of local occupational blood and body fluid protocols / policies?	1) Fully familiar 2) Partially familiar 3) I don't know that such protocols exist
4	Is your protocol / policy user friendly	1) Yes 2) No
5	Do you know how and where to report an occupational blood and body fluid exposure?	1) Yes 2) No
6	Do you know where to get the ARV starter pack?	1) Yes 2) No

Please add any other comments:
…………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

Part 2

1) How many occupational blood or body fluid exposure have you experienced? _______

No.	Question	Response per exposure	1	2	3	4	5	6	7
2	What actions did you take after each exposure?	a) Ignore and continue							
		b) Wash exposure area and or replace gloves and continue							
		c) Follow each step of local policy							
3	What was the nature of each exposures?	a) Deep wound (blood seen)							
		b) Superficial wound (blood not seen)							
		c) Mucocutaneous exposure							
		d) Non-intact skin exposure							
4	Where did each exposure occur?	a) Surgery							
		b) Internal Medicine							
		c) Obstetrics & Gynaecology							
		d) Paediatrics							
		e) Emergency Department							
		f) Orthopaedics							
		g) Psychiatry							
		h) Anaesthesia							
		i) Other (specify)							
5	What procedure were you undertaking during each exposure?	a) Vascular puncture / intravenous line insertion							
		b) Wound suturing							
		c) Putting up a chest drain							
		d) Assisting in surgical procedures							
		e) Recapping used needles							
		f) Putting blood into specimen bottle							
		g) Amniotic fluid splash							
		h) Overfilled sharps container							
		i) Other (specify)							
6	What were the types of devices causing needle stick injuries in each case?	a) Suturing needle							
		b) Intramuscular / intravascular puncture needle							
		c) Intravenous catheter needle							
		d) Butterfly needle							
		e) Scalpel / blade							
		f) Other (specify)							
7	What were the circumstances around each exposure?	a) Working shift >12 hours							
		b) Working without supervision							
		c) Poor instruments							
		d) Poor lighting							
		e) No assistant present							
		f) Tiredness/ fatigue							
8	How soon did you report to the relevant person after your exposure?	a) Within 24 hours							
		b) 24-48 hours							
		c) 48-72 hours							
		d) >72 hours							

		e) Didn't report the incident							
9	Did you start ARV's after each exposure?	Yes							
		No							
10	Did you complete the 28-day course of ARV's in each exposure?	a) Yes							
		b) No, because							
		Gastrointestinal side effects							
		Felt terrible on the medications							
		Didn't know it was necessary to complete							
		Too many drugs							
		Patient tested negative							
		No time to take medication							
11	Which core ARV regimen did you use for each exposure?	a) AZT / 3TC (or emtricitabine)							
		b) TDF / 3TC (or emtricitabine)							
		c) D4T / 3TC (or emtricitabine)							
		d) Other (specify)							
12	Did you use a third ARV in each exposure?	a) No							
		b) Yes, please specify							
		Lopinavir/ritonavir							
		Raltegravir							
		Atazanavir/ritonavir							
		Nevirapine							
		c) Not sure							
13	Were you using personal protective equipment (PPE) during each exposure?	a) Gloves							
		b) Facemask							
		c) Goggles							
		d) Plastic apron							
		e) Other (specify)							
14	Did you do a follow-up blood test?	Yes							
		No							
15	Did you acquire any infection as a result of your exposure?	No							
		Yes, please specify							
		Ya) HIV							
		Yb) Hepatitis B							
		Yc) Hepatitis C							
		Yd) Other (specify							

The current available PEP regimen containing AZT and or Lopinavir has significant side effects.

16. Are you aware of PEP regimens with less side effects? Yes / No

If yes, were you able to afford to purchase them privately? Yes / No

Please add any other comments:

……………………………………………………………………………...……………………….

APPENDIX II: LETTER TO HOSPITAL CEO'S

Dear Professor / Doctor / Sir / Madam

Re: **Permission to Conduct a Master of Science (MSc) Research**

Above subject matter refers.

I am current registered at the University of Witwatersrand as a postgraduate student for the 2017 academic year. I'm approaching your humble office to kindly grant me permission to carry out my research in your reputable institution which is a part of the requirement of my MSc Med degree in Emergency Medicine. My proposed research study is entitled: **Occupational blood and body fluid exposure amongst medical interns in Gauteng** (please see attached protocols proposal).

If granted permission the study will take place at this hospital on all medical interns in their various clinical posting departments. The study will not interfere with normal service delivery as questionnaires will be administered during various departmental meetings and lunch break respectively. Neither the hospital nor the intern will incur any expenses because of this study. Minor expenses will be borne by me. I will ensure that patient care and medical intern work schedules are not compromised.

Thanks for your anticipated consent.

Yours faithfully

______________________   _____________

Dr S Aigbodion (Researcher)   Date

I …………………………………………… (CEO / superintendent) hereby grant / do not grant permission to Dr S Aigbodion to carry out the research study as outlined above, pending ethics approval.

Remarks

…………………………………………………………………………………………..……

………………………………………………………………………………………………
………

______________________________   _____________

CEO / Superintendent   Date

(Name ______________________)

APPPENDIX III: PARTICIPANTS INFORMATION AND CONSENT SHEET

Re: Occupational blood and body fluid exposure amongst medical interns in Gauteng study

-

1. **Background and aims of the study**
   This research hopes to investigate occupational blood and body fluid exposure amongst medical interns in Gauteng. The study is funded by the primary researcher.
2. **Why have I been invited to take part?**
   You have been invited because you are involved in the management of patients presenting for medical care.
3. **Do I have to take part?**
   No. You can ask questions before the study before deciding whether or not to participate and you may freely withdraw yourself/data from the study at any time.
4. **What will happen in the study?**
   You will be asked complete a specifically designed questionnaire. The completion of the questionnaire is expected to take 10 minutes.
5. **Expenses and payments.**
   There will be no payments for taking part in this research.
6. **What happens to the data provided?**
   Data will be collected anonymously and any personal information stored confidentially.
7. **Will the research be published?**
   The research results may be published both locally and internationally.
8. **Who do I contact if I have concerns about the study?**
   For any concerns and clarifications please contact the researcher listed below, or the Ethics Committee; University of the Witwatersrand at 011-717-1252.

Further information and contact details

Researcher: Sunday Aigbodion, email address: sundayj4god@gmail.com, cell: +27638184677

Supervisors:	**1. Dr Abdullah Laher**	**2. Dr Feroza Motara**
Email:	**abdullahlaher@msn.com**	**feroza.motara@wits.ac.za**

I ………………………………………………..……….. (name) consent to participate in the above study.

______________________ __________________

Signature Date

APPENDIX 1: ETHICS CLEARANCE CERTIFICATE

R14/49 Dr Sunday Joseph Aigbodion

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M170496

NAME: (Principal Investigator)	Dr Sunday Joseph Aigbodion
DEPARTMENT:	Emergency Medicine Charlotte Maxeke Johannesburg Academic Hospital Chris Hani Baragwanath Academic Hospital Far East Rand Hospital/Thelle Mogoerane Regional Hospital
PROJECT TITLE:	Occupational Blood and Body Fluid Exposure amongst Medical Interns in Gauteng
DATE CONSIDERED:	05/05/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr Abdullah Laher and Dr Feroza Motara
APPROVED BY:	Prof P Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	19/07/2017

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 301, Third floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in April and will therefore be due in the month of April each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

APPENDIX 2: TURN-IT-IN-REPORT

a0010050:Turnitin-S_Aigbodion_Article_format_08_Feb_2019.docx

ORIGINALITY REPORT

1%	%	%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Curtin University of Technology Student Paper	1%
2	Submitted to University of Hull Student Paper	1%

Exclude quotes	On	Exclude matches	< 1%
Exclude bibliography	Off		