

Needle Stick Injury by Aqueous Humor of a 31-year-Old PCR-Positive HIV Patient: A Case Report

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Abstract

Background: Health worker Needle-stick injury (NSI) by internal body fluids can transmit serious pathogens like HIV. Considering Principles of personal and occupational care, plays an important role in prevention of such events.

Case presentation: A health worker suffered needle stick injury by aqueous humor of a PCR-positive HIV patient while he was recapping needle despite necessary preparations.

Conclusions: NSI by Aqueous humor which is secreted from blood, can theoretically transmit blood borne pathogens like HIV. Nevertheless, there is neither any report of aqueous humor NSI nor HIV transmission in this way. Based on our best knowledge this case is the first report represents HIV+ aqueous humor NSI and further evidence is required. Considering literature, we cannot conclude whether there was a need for PEP in our case.

Keywords: Aqueous humor • Needle stick injury • PEP

Abbreviations: NSI: Needle Stick Injury • PEP: Post Exposure Prophylaxis

Introduction

Needle stick injury is Nightmare of healthcare workers because of blood borne pathogens like HIV. We know some risk factors like needle hollowness, deep tissue penetration, high viral loads and prolonged exposure that increase transmission possibility. In this case an ophthalmology resident got needle stick injury by needle that used for aqueous humor aspiration in a HIV+ patient while the resident was fully protected.

Case Presentation

A 31-year-old man came to our clinic with chief complaint of right eye blurred vision since 2 weeks before. Fundoscopy exam demonstrated whitish patches of retinitis mostly involving posterior pole of retina. Lesions followed vessels and arcades of retina. Also there were hemorrhagic spots, classic frosted branch angitis and minimal vitritis (Figure 1). Clinical diagnosis was compatible with CMV retinitis. So patient admitted and treated with antiviral agents. Blood viral markers checked because CMV retinitis is one of the AIDS presentations and then he was HIV seropositive. Next day, ophthalmology resident tried for aqueous sampling while he knew patient serologic results. So he wore protective glasses and needle resistant gloves. Then he used 27-gauge bent insulin needle to aspirate aqueous (Figure 2A) at the end, to fit the cap, held it and pushed the needle forcefully but the bent needle passed through the cap thickness and penetrated glove and the resident's finger (Figure 2B). He went promptly to the Behavioral Diseases Counseling Center and received three-drug post-exposure prophylaxis for 28 days. Later his HIV-antibody tests were negative in 3-times based on guideline intervals.

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Few days after event, aqueous humor PCR results prepared which was highly positive for both CMV and HIV.

Discussion

Many reports represent needle stick high frequency in surgical residents. A Cross-sectional study reports that 83% of orthopedic residents/fellows, and 100% of faculty at one institution, had been exposed to a sharps injury at some point in their career [1]. Another survey studied the incidence of needle stick among all surgical personnel at a single academic institution [2]. They showed



Figure 1. Fundus photographs of the our patient demonstrating white-yellowish retinitis lesions mostly along vascular arcades(asterisks). Also hemorrhagic vasculitis and exudates are seen (arrow).

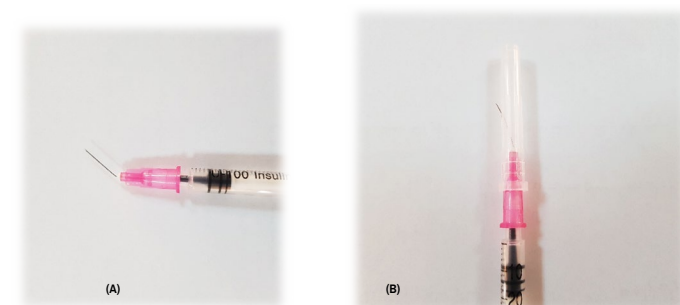


Figure 2. (A and B) Bent needle for AC tap (left). Needle penetrated cap (right).



Figure 3. Safety box for disposing needle properly.

higher rates of needle stick injury among surgical staff compared with other nonsurgical personnel.

Unfortunately, psychological stress after needle stick affects individual and occupational performance and leads to post-traumatic stress disorder and work loss [3]. There is a report demonstrate the average cost of a NSI is US\$747 (range US\$199-1,691). So prevention of such events helps health system economy [4]. The two factors of prevalence and cost of these events indicate the importance of prevention and education about it.

The case above demonstrates an injury could have been prevented by dispose of the needle properly using safety boxes (Figure 3). It didn't happen if resident used safety boxes and didn't try recapping process using hands. But this doesn't work sometimes. We usually use syringe to send the sample to the lab. The needle helps prevent the sample being wasted. So we need to do recapping process carefully.

Some clinicians suggest bending the needle for aqueous sampling. They presume bending may help better controlling the needle and the eye. We think this is not helpful and results in consequences like NSI and difficulties in aqueous sampling because of increased resistance of fluid flow. So needle bending is not routinely recommended.

Another consideration in this case is post-exposure prophylaxis (PEP). The key point to start PEP is risk assessment. WHO published a practical guideline in 2015 which declared exposures need PEP include: 1-Bodily fluids: blood, blood-stained saliva, breast milk, genital secretions; cerebrospinal, amniotic, peritoneal, synovial, pericardial, or pleural fluids. 2-Mucous membrane: sexual exposure; splashes to eye, nose, or oral cavity, 3-Parenteral exposures [5].

It also noted Exposures that do not require HIV PEP include: 1- Exposed person is HIV already positive. 2- The source is established to be HIV negative. 3-Exposures to bodily fluids that do not pose a significant risk, i.e., tears, non-blood-stained saliva, urine, and sweat.

Another published guideline in 2020 noted the transmission risk is significantly higher in cases of more than 1 risk factor: deep injury, hollow bore needle and high viral load [6-8].

Conclusion

Considering literature, we cannot conclude whether there was a need for PEP in our case. But the Behavioral Diseases Counseling Center encouraged us to use PEP. There are reports detecting HIV in anterior chamber aqueous humor. In both above guidelines, aqueous humor is not mentioned. NSI by

Aqueous humor which is secreted from blood can theoretically transmit blood borne pathogens like HIV. Nevertheless, there is neither any report of aqueous humor NSI nor HIV transmission in this way. Based on our best knowledge this case is the first report represents HIV+ aqueous humor NSI and further evidence is required.

Declarations

Consent for publication Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal. All data and material are accessible at Farabi Eye Hospital date center and are not published on the Internet. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Authors' Contributions

Study conception and design: Bohrani M.D.

Acquisition of data: Bohrani M.D.

Drafting of manuscript: Dehghani M.D.

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