

## Needle stick injuries among the medical students; some interesting case studies

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*Needle stick injury is an important accidental exposure among medical personnel. Medical students are a high-risk group for this injury due to their lack of experience. In this article, three interesting cases of needle stick injury among medical students were reported and discussed. The first case was a male medical student who was injured due to piercing the needle through its cap. The author raised the issue of manufacturer quality control of medical procedure devices. The second case was a male student who was injured due to piercing the needle through a disposable box. The details about the disposable box and cost effectiveness evaluation of this preventive device were discussed. The third case was a male medical student who was injured while practising without basic knowledge and without supervision. This case reflects the importance of supervision in medical practice, and it emphasises the importance of basic skill training, starting with the details of safety equipment before "hands-on" medical training.*

**Key words:** *Needle stick injury, Medical student.*

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**วิจารณ์ ไววานิชกิจ. บาดเจ็บจากถูกเข็มตำในนิสิตแพทย์ ตัวอย่างกรณีศึกษา. จุฬาลงกรณ์เวชสาร 2544 มี.ค; 45(3): 241 – 5**

บาดเจ็บจากการถูกเข็มตำจัดเป็นอุบัติเหตุที่พบได้บ่อยในกลุ่มบุคลากรทางการแพทย์ นิสิตแพทย์จัดเป็นกลุ่มที่มีความเสี่ยงต่ออุบัติเหตุชนิดนี้มาก เนื่องจากการขาดประสบการณ์ ในบทความนี้ได้รายงานกรณีศึกษาเกี่ยวกับการถูกเข็มตำในนิสิตแพทย์จำนวน 3 กรณี กรณีที่ 1 เป็นนิสิตแพทย์ชายถูกเข็มแทงทะลุปลอกเข็มตำมือ ในกรณีนี้ผู้นิพนธ์ได้อภิปรายเกี่ยวกับคุณภาพมาตรฐานของอุปกรณ์สำหรับการทำหัตถการ กรณีที่ 2 เป็นนิสิตแพทย์ชายถูกเข็มแทงทะลุกล่องทังเข็มตำมือ ในกรณีนี้การจดหากล่องทังเข็มที่มีมาตรฐานเป็นสิ่งจำเป็น การพิจารณาความคุ้มค่าทางเศรษฐศาสตร์การแพทย์ในการจัดหาอุปกรณ์เพื่อป้องกันอุบัติเหตุเป็นสิ่งที่น่าสนใจในปัจจุบัน กรณีที่ 3 เป็นนิสิตแพทย์ชายที่เกิดอุบัติเหตุเนื่องจากไม่ทราบรายละเอียดของอุปกรณ์ที่ใช้งานและฝึกปฏิบัติเองโดยไม่อยู่ในความควบคุมดูแลของผู้มีความชำนาญ ได้อภิปรายถึงการสอนการทำหัตถการในนิสิตแพทย์ โดยเสนอแนวความคิดในการฝึกปฏิบัติภายใต้การควบคุมอย่างใกล้ชิดและแผนการฝึกอบรมอย่างละเอียดโดยใช้สื่อเสริมที่เหมาะสม และเน้นตั้งแต่ความรู้เบื้องต้นเกี่ยวกับอุปกรณ์ที่จำเป็นในหัตถการ

**คำสำคัญ:** เข็มตำ, นิสิตแพทย์

Needle stick injury is the most important type of accidental injury among medical personnel.<sup>(1)</sup> Medical students are considered to be a high-risk group for this injury due to their lack of experience. Although there have been many studies about accidental exposure among Thai medical students,<sup>(2-4)</sup> and many recommendations on how to prevent accidental needle stick injury among medical students have been made, there are still reported cases occurring.

The study in detail of each accidental case is useful for root cause analysis of the problem. In this article, the author reports three interesting case reports of needle stick injuries among medical students.

## Case reports

### Case 1

A 21 year old male clinical year medical student reported an accidental needle stick injury during his medical anesthesiology practice. The accident occurred while he was being trained under supervision. After the practice of local anesthesia infiltration, he used a one handed technique to cap the needle for moving it to the waste bin. He then grasped the syringe and was injured by the needle the end of which had pierced needle through the plastic needle cap.

His advisor instructed him to clean the wound and gave some counseling. Due to the fact that the patient was an elective case with negative preoperative serology and was a repetitive blood donor, this student decided not to take anti-retroviral drugs or to obtain subsequent.

### Case 2

A 19 year old male pre-clinical year medical student reported an accidental needle stick injury

during venipuncture practice. He revealed that he had practiced by himself without a supervisor. He reported that he performed the venipuncture on many unknown patients on that day and the accident had occurred after he disposed the needle into a disposable box. He was injured from the needle end which had pierced through the box.

This student received counseling, anti-retroviral drugs and serology follow up. The serology of this student was still Anti-HIV seronegative after 6 months follow up.

### Case 3

A 19 year old male pre-clinical year medical student reported an accidental injury episode while practicing venipuncture in a training class. He was using an unfamiliar technique for venipuncture (evacuated blood collection system). He revealed that the accident occurred after the veinpuncture procedure had been completed. After a one-handed cap of the exposed end of the needle, he was unaware that the needle had another end with rubber sleeve. Therefore, he grasped that end and was injured. This student got the counseling and serology follow up but he refused for anti-retroviral drugs.

## Discussion

These cases are good examples of needle stick injury management among medical students. It is described that most needle stick injury episodes occurred after the medical procedure had been completed and due to the two-handed capping or recapping of the needle.<sup>(5)</sup> The most common type of needle that causes accidental injury is the venipuncture needle. This fact may due to the fact that venipuncture is the most commonly practiced basic medical

procedure.

Concerning medical students, accidental needle stick injury is totally unwanted but a high prevalence is still detected in Thailand,<sup>(2-4)</sup> especially for clinical – year medical students. Possibly this is because this group of medical students is the basic medical personnel on the ward without experience and sometimes is neglected by the supervisor. Wiwanitkit V. stated that one factor that influenced accidental exposure among medical students was practicing without supervision.<sup>(4)</sup>

In the first case, the accidental injury occurred although the training was under the control of a supervisor. The major cause was the ineffective needle equipment. Considering the quality of the equipment at the present time control of manufacturer quality is necessary. Often, below - standard protective devices such as easy-to-tear gloves were used in training. Though a number of manufacturers, needle stick-prevention devices (Table 1) are produced,<sup>(6-7)</sup> most of them are rather difficult to use and must be checked for quality. The question that whether a one-handed capping technique before disposing of the needle, or disposing without cap is better is widely discussed.

In the second case, training without supervision seems to be a serious problem leading to accidental injury among medical students. Most accidental injuries occur during procedures that have frequently been performed and are considered simple. Therefore, it can be said that accidents always occur together with carelessness. In this case another interesting point is the cause of the injury; did the disposable box match the standard quality? Although there are many innovative disposable boxes, most of them are expensive and therefore, it may seem not suitable for a Thailand setting. Many locally-made systems such as used powdered milk cans or oil gallons are used as disposable boxes. The important topic is whether the material composition of the produced box can prevent needle piercing or not. Sometimes it is cost effective to provide the standard disposable box to use, compared with the cost of needle stick injury.<sup>(8)</sup>

The third case is also interesting; the accidental injury primarily occurred due to lack of knowledge about the medical procedure. Before training in a real situation, a proper training program should be set. Furthermore, an effectiveness study

Table 1. Needle stick-prevention devices.

Product groups	Comments
1. Needle medication, vaccine injector	Limited IM application
2. Prefilled medical system	Required sharp container
3. IV starter with catheters	Poses hazard if misplaced in linen
4. IV medication connector	Useful to piggy back medication
5. Blood collection system	May pose risk of inner-needle exposure
6. Disposable syringe	Available in specific volume
7. Needle guard	Used with syringes and blood adapters
8. Needle-recapping devices	May not be available when needed

of the training should be performed. To practice without good knowledge and skill may harm not only the patient but also the practitioner. To study new medical procedure techniques, a basic description should be provided, starting with the details of the equipment used.<sup>(9)</sup>

These three cases are only examples of needle stick injuries among medical students, which seems to be very important problem in this era. Review of the accidental injury files and prospective surveillance of the accidents should be continuously performed. The author still states that the best way to prevent needle stick injury is carefully practice. Supplementary training method as model-based method should also be used in medical training.<sup>(10-12)</sup>

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