

## SAFIRA pump: A novel device for fixed injection pressure and to control local anesthetic injection during peripheral nerve block

Dear Editor,

The use of ultrasound (US) has not only enhanced the success of peripheral nerve block (PNB), but also the incidence of complications like local anesthesia systemic toxicity, vascular injury, phrenic nerve involvement, and pneumothorax has also reduced.<sup>[1,2]</sup> High injection pressures are possible when the needle is in contact with neural structures like paraneurium, epineurium, and also when the needle is in structures like tendons, ligaments and, fasciae. To prevent injecting LA at high pressures, many societies recommend the use of an injection pressure manometer so as to know the resistance offered during injecting. When the pressure is more than 20 pounds per square inch (psi), the needle could be intraneural and thus needs to be withdrawn to prevent possible injury. For commercial use, there are many manometers and syringe pumps with fixed pressure injector which has been validated in animals, cadavers, and in case series. They are Control Disc Stimulation Device, BSmart (B. Braun, Melsungen, Germany), improvised pressure gauge, compressed air injection technique, and an optical fiber pressor sensor embedded within the shaft of the needle developed by Saporiti *et al.*<sup>[3,4]</sup>

Medovate, a company from the United Kingdom, has introduced the SAFIRA system i.e., SAFeR injection in regional anesthesia pump [Figure 1]. The SAFIRA system has three components; a sterile syringe, a driver, and a foot pedal. The foot pedal has two parts, a green and a yellow. On pressing the green part

of the foot pedal, the syringe loaded with LA will deliver the drug at the intended site. The yellow end of the foot pedal is pressed to aspirate prior to injecting LA. There are three driver indicator lights: green which means infusing, yellow depicts aspiration, and red suggests that the injection/syringe is over or has a low battery. The driver and foot pedal can be used for up to 200 peripheral nerve blocks before replacement is required. However, the syringe is for single use.

In a study by Heij *et al.*, investigators asked 20 anesthesiologists (phase one) to perform a US-guided injection of 20 ml LA in a chicken leg using a 20 ml syringe. A total of 14 injections (70%) were performed at a pressure of 15 psi or more.<sup>[5]</sup> In phase two of this study, the SAFIRA pump was used by 20 participants were all injections were performed at 5 and 10 psi with no injection delivered if pressure reached above 15 psi. Presently, this is the only study that has explored the efficacy of this novel system although it was a chicken leg. It is approved for use by US-Food and Drug Administration (US-FDA) and European commission and is currently available in United States, Israel,



**Figure 1:** The SAFIRA components. Figure shows the 20 ml sterile syringe in a dedicated syringe pump and the foot pedal. On pressing the green end there will be injection of local anaesthetic and with yellow end there will be aspiration performed prior to injection to confirm intravascular needle placement. (Figure source: <http://www.medovate.co.uk/>. Permission sought from the company to use the image)

Australia, and New Zealand (<https://www.medovate.co.uk/news/medovates-game-changing-anaesthesia-device-safira-receives-european-ce-regulatory-approval>). However, the popularity of the SAFIRA system will depend upon the cost-effectiveness of the assembly and also on further studies that compare SAFIRA system with other injectors.

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### Conflicts of interest

There are no conflicts of interest.

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