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EDITORIAL COMMENTARY

Intravenous Cannulation in Children – Can the Pain Be Frozen?

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Inserting a peripheral venous cannula is perhaps the most common invasive painful procedure done for children in a hospital. The pain and anxiety associated with any procedure involving needles in children is deep rooted and is a stressful experience for both the child and parents. There are reports of possible long term effects of painful procedures in children [1]. Any effort to alleviate the suffering of children in the healthcare setting is welcome and there has been numerous efforts, involving both pharmacological and non-pharmacological interventions, over the years to address this. The non-pharmacologic interventions tried range from distraction techniques like oral pacifiers, kaleidoscopes, bubble blowing, music, videos, immersive virtual reality etc. [2]. In addition, pharmacologic interventions like EMLA cream, buffered lidocaine, vapocoolant spray etc. have also been employed commonly. The availability, adoption and usage of multiple interventions point towards the possibility that most of them may have only marginal benefit.

In this context, in this issue of the Journal, Xess et al. have reported the results of their RCT comparing EMLA cream and CoolSense (cryo analgesia) in reducing pain during intravenous cannulation in children [3]. They studied a total of 140 children (70 in each group) 6–12 y of age, undergoing intravenous cannulation for induction of anesthesia. The primary outcome measure, pain during the cannulation was reported by the children using a visual analogue scale. It is not clear whether the trial team interacting with the children while assessing the primary outcome was blinded to the intervention, so that any bias while reporting can be minimised. The authors have reported a significant reduction in pain scores in the CoolSense group compared to the EMLA cream group (mean pain score 7.14 ± 4.322 vs. 29.32 ± 8.95, p value 0.001) [3]. In addition, there was significant decrease in the anxiety level in the CoolSense group as compared to the EMLA group. The duration of application of CoolSense was significantly less than EMLA cream. Overall the authors have concluded that CoolSense was more efficacious than the EMLA cream in pain relief and that it appears to be a simple and rapid means of providing adequate analgesia for intravenous cannulation in children [3]. Similar cooling techniques have been studied extensively in the past, the most popular being vapocoolants (cold sprays). A systematic review by Hogan et al. involving twelve studies including 1266 patients (509 children, 757 adults) concluded that vapocoolants were ineffective in children and adults when compared to placebo [4]. But a subsequent Cochrane review by Griffith et al. concluded that there is moderate-quality evidence that use of a vapocoolant immediately before intravenous cannulation reduces pain during the procedure [5]. Similarly, another device delivering external cold and vibration (Buzzy) developed in the USA, also has been evaluated in multiple studies. A systematic review of 9 RCTs involving 1138 participants aged between 3 and 18 y concluded that the comparative effect is uncertain due to the presence of heterogeneity and very low-quality evidence [6]. It is noteworthy that in all the three systematic reviews mentioned above, the efficacy of the cooling intervention was compared against either a placebo / no treatment. Two of them were non-conclusive regarding potential benefit. But in the present study, Xess et al. have compared their cooling device against EMLA cream and still reported a significant efficacy in pain relief [3]. This is interesting if found true in future studies. It is also reassuring that none of the studies using surface cooling as an intervention have reported any difficulty in cannulation as can be expected with surface cooling and the resultant vasoconstriction.

Hence to summarise, the study by Xess et al. is interesting as it is one of the few studies showing superior efficacy of a cooling technique in reducing pain during intravenous cannulation even when compared to a pharmacologic agent like EMLA cream. Like any other study involving a subjective outcome like pain, the same needs to be confirmed by future

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studies in other settings before we jump to conclusions and start freezing the arms of our little patients.

Declarations

Conflict of Interest None.

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