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LETTER TO THE EDITOR

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Effect of cannula size on pain on propofol injection in children receiving general anesthesia—an observational study

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Sir,

Pain on injection of Propofol during general anesthesia has not been studied in children. After approval from the Institutional Ethical Committee and obtaining consent, a total of 120 children of age group 7 to 15 years posted for surgery under general anesthesia were included. Children with egg allergy, hemodynamically unstable patients, and local bruising or skin redness were excluded. Patients were allocated into 2 groups: Group 1–22 gauge (G) cannula and Group 2–24 G cannula. Intravenous (IV) canulation was done in the preoperative area. The site and size of the cannula were decided upon the availability of the vein by the anesthesia team. Children were shifted in OT, and standard monitoring was done. Then, preservative-free Inj. Lidocaine (0.5 mg/kg) was given IV and manual occlusion was done for 60 s. Then, induction of anesthesia was started with 1% Propofol (2–3 mg/kg) administered IV over a period of 20 s. Pain perception by the patients on propofol induction was scored with 4 point verbal scoring system (Ohnhaus et al. 1975): (1) no pain, no reaction to the injection; (2) slight pain (minor verbal or facial response); (3) moderate pain (clear verbal or facial response); and (4) severe pain (patient complains of pain and withdraws the arm). The primary outcome was the effect of cannula size on the intensity of pain caused by propofol injection. The secondary outcomes were to observe change in heart rate and blood pressure.

There were 87 males and 33 females. Group 1 (22 G cannula) and Group 2 (24G cannula) had 55 and 65 patients, respectively. Thirty-six (30%) patients underwent cannulation of a large vein in forearm while eighty-four (70%) were cannulated at a small vein at the dorsum of the hand. In this study, 73.3% (88/120) patients felt pain during propofol injection and 26.7% (32/120) felt no pain.

Of the 88 patients with pain, 49 (55.7%) had mild pain, 28 (31.8%) had moderate pain, and 11 (12.5%) had severe pain. In these patients, 16% were cannulated in a forearm vein and 84% in a dorsal hand vein ($p < 0.05$), like (McCulloch et al. 1985). In these patients, 38.6% patients size 22 G cannulae were used and in 61.4% 24G cannulae were used ($p < 0.05$).

Patients who felt no pain, 31.3% of patients received propofol through a cannula inserted in the dorsum of the hand, while 68.7% received the drug through a cannula inserted in the forearm; p value (0.007). In this group, 65.6% 22G cannula and 34.4% 24G cannula were used; p value < 0.001.

There is a significant increase in heart rate ($p < 0.001$) and mean arterial pressure ($p = 0.003$) post-intervention in 24 G cannula group as compared to 22 G cannula group as in (Dewhirst et al. 2013) and (Imanaka et al. 2009).

In our study, propofol injection pain was 62.8% in patients with larger cannula and 83.1% in those with

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smaller cannula. A bigger cannula reduced discomfort, supporting results of Bachmann et al. 2003

We found that children had less pain when propofol was injected into a larger forearm vein than a smaller dorsal hand vein and when a larger gauze cannula was utilized.

Abbreviations

G	Gauge
IV	Intravenous
OT	Operation theater

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Authors' contributions
PY contributed to the study conception, design, data acquisition, and drafting the article. SG and AS contributed to the data acquisition and drafting the article. NK contributed to the interpretation of the data and revising the article. PB contributed to revising the article. The authors have read and approved the manuscript.

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Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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