

## Safety of subarachnoid block in pediatric patients with dilated cardiomyopathy in congestive cardiac failure

Sir,

Dilated cardiomyopathy (DCM) is characterized by enlargement and dilation of one or both ventricles along with impaired contractility with left ventricular ejection fraction (LVEF) of <40% which is progressive with poor survival rates.<sup>[1]</sup>

A 4-year-old boy, weighing 14kg, was posted for wound debridement of bilateral below knee ulcers. He was admitted with breathlessness and swelling over legs. He had history of viral myocarditis, severe left ventricular (LV) dysfunction, ejection fraction (EF) of 20%, dilated LV/global hypokinesia, and was diagnosed with DCM with congestive heart failure.



**Figure 1:** X-ray chest showing cardiomegaly

He was treated with intravenous (IV) frusemide 2mg/kg/day and levosimendan infusion 0.1 mcg/kg/min. Currently, he was on milrinone 0.5 mcg/kg/min and frusemide 2mg/kg/day infusions; oral digoxin 1mg on alternate days; and intravenous fluid (IVF) 45mL/hour. Poor prognosis and chance of sudden cardiac death (SCD) were explained to parents. Echo on day of surgery showed DCM, severe biventricular dysfunction, mild pulmonary artery hypertension, dilated ventricles, severe global LV hypokinesia, and severe left and right ventricular dysfunction with LVEF of 14%. Serum electrolytes were normal. Chest X-ray showed cardiomegaly [Figure 1].

As the child was irritable and not cooperative, surgery under nerve blocks and, in view of poor cardiac status, general anesthesia (GA) was not opted for. In the theater, infusions of milrinone, frusemide, and IVF were continued at the same rates through central line. Electrocardiogram, pulseoximeter, and invasive blood pressure (BP) monitors were attached. BP was 86/58 mmHg, and heart rate was 88 beats per minute. 10mg of ketamine was given IV and subarachnoid block was given with 1.6 mL of 0.5% bupivacaine heavy using a 25G spinal needle in a slightly head-up position. Systolic BP remained 90–95 mm Hg after spinal, with block upto T12 level. The surgery lasted one hour. The child underwent wound debridement three more times and skin grafting on the fourth sitting, over a period of three weeks. With gradual deterioration of cardiac status, GA was never considered. All procedures were done under subarachnoid block and were uneventful. He developed no complications pertaining to frequent dural punctures.

A previous myocarditis is the most frequent cause of DCM in children with 40% mortality. Children with DCM predominantly experience SCD from pump failure and risk factors are early age at diagnosis, LV dilatation, LV posterior wall thinning (<14 mm) at presentation, heart failure, and low EF.<sup>[2,3]</sup> The main goals of anesthetic management in patients with DCM are to avoid myocardial depression, maintain adequate preload and prevent

increases in afterload, avoid tachycardia, and prevent sudden hypotension by careful titration of anesthetic agents. Central neuraxial blockade may reduce afterload and improve cardiac output, but accompanying hypotension resulting in myocardial hypoperfusion must be prevented. During GA, avoid overdosage of induction agents as circulation time is impaired.<sup>[4]</sup>

Subarachnoid block in children requires a higher dose of local anesthetic due to higher CSF volume with shorter duration of motor block.<sup>[5]</sup> Hypotension is less, especially in the younger ones, due to immature sympathetic system. It is concluded that subarachnoid block, if carefully chosen, can be a safe alternative to GA in high-risk pediatric patients.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

**Niranjan K. Sasikumar, Sunil Rajan,  
Annu S. Abraham, Jerry Paul**

Department of Anaesthesiology, Amrita Institute of Medical Sciences,  
Amrita Vishwa Vidyapeetham, Kochi, Kerala, India

**Address for correspondence:** Dr. Sunil Rajan,  
Department of Anaesthesiology, Amrita Institute of Medical Sciences,  
Kochi, Kerala, India.  
E-mail: sunilrajan@aims.amrita.edu

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