Reviewer's report

Title: Single-center experience with levosimendan in children undergoing cardiac surgery and in children with decompensated heart failure

Version: 1 Date: 17 June 2011

Reviewer: Shahzad Raja

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General comments

Levosimendan is a calcium sensitizer that enhances the contractile state of the ventricle by increasing myocyte sensitivity to calcium. It binds to myocardial troponin C to improve the efficiency of the contractile apparatus. The improvement in myocardial performance and systolic function is accomplished without an increase in intracellular cyclic adenosine monophosphate or intracellular calcium, thus avoiding well-known adverse effects of catecholamines on cardiac relaxation and diastolic function. Levosimendan also stimulates adenosine triphosphate-sensitive K+ channels and induces vasodilation. Levosimendan also has potentially cardioprotective effects through mitochondrial effects linked to preconditioning in response to oxidative stress. In humans it reduces circulating proinflammatory markers and soluble apoptosis mediators in patients with decompensated heart failure. The appeal of a drug that increases cardiac output, decreases cardiac filling pressures, reduces afterload on the ventricles, and has anti-inflammatory properties is enormous in pediatrics. With its positive inotropic effects, levosimendan may be of value as adjunctive therapy to other inotropic drugs in patients who are refractory or resistant to other forms of inotropic support.

The manuscript by Dr. Suominen describes the largest experience to date of usage of levosimendan in pediatric population. The manuscript is primarily an audit of the practice of levosimendan usage and has several limitations. In the opinion of this reviewer the quality of the manuscript will be further enhanced if the author incorporates the following suggestions in the revised version.

Major Compulsory Revisions

1. The group is heterogeneous in age, ranging from newborns to young adults. The author must provide a graph showing the distribution of patients within the different age groups.

2. The author must include a graph (or graphs) showing the etiologies of cardiomyopathy and cardiac failure.

3. It is important that the author provides information regarding the hemodynamic data for these patients. A comparison of pre-levosimendan and post-levosimendan measurements of cardiac output, left atrial pressure, pulmonary artery wedge pressure, central venous pressure and changes in the severity of heart failure must be provided either in graphical or tabulated form.
4. The author must provide information regarding the other vasoactive drugs that these patients were receiving prior to introduction of levosimendan.

5. The author must provide information on impact of levosimendan on discontinuation of other vasoactive drugs.

6. How are patients in cardiac failure risk stratified in the author’s institution? Some insight is needed.

Minor Essential Revisions
1. Please include the Questionnaire in the Appendix.
2. Page 9, line 3 please change dilatated to dilated.
3. Please ensure that the references in the bibliography are cited according to the Journal requirements.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests.