A new strategy for anticoagulation in infants with prosthetic mitral valves

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For Children

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BACKGROUND

Infants with congenital heart disease may require prosthetic mitral valve placement for leaking left atrio-ventricular valve (AVV) following cardiac surgery. Historically, warfarin anti-coagulation has been fraught with problems of poor control. We describe a new method of anticoagulation in infants which has successfully circumvented the issues.

Figure 1¹ Antithrombin (AT), a serine protease inhibitor, is the major plasma inhibitor of coagulation proteases². LMWH inhibits the coagulation process by binding to antithrombin, accelerating its inhibition of activated factor X (Factor Xa). Warfarin inhibits the vitamin-K dependent synthesis of clotting factors II, VII, IX, and X^{3,4}.

METHODS

From our Heartsuite™ database, three children (2 boys, 1 girl) with complete atrio-ventricular septal defect were found to undergo repair in infancy. The median (range) age at first operation was 55 days (47-111) and weight 3.21kg (3.2-4.3). All had severe left atrio-ventricular valve regurgitation postoperatively and underwent mitral valve replacement (16 carbomedics in each) after a median of 71 days.

RESULTS

- Emergency valve dysfunction often occurred in patients who have had mitral valve replacement under the standard warfarin regime despite increasing the international normalised ratio (INR) to 3-4.
- Low molecular weight heparin (LMWH) was added to warfarin therapy and regulated by maintaining anti-Xa level at 0.35-0.5 and INR level 2-3.
- None of the children required further valve replacements or sustained haemorrhagic episodes, with the oldest patient being 8 years old.

Results	Patient A	Patient B	Patient C
Sex	Male	Male	Female
Age at first operation (days)	111	47	55
Weight at first operation (kg)	4.3	3.21	3.2
Heparin dose (mg) (OD)	6	9.5	6

CONCLUSION

Concurrent therapy with LMWH and warfarin can be effective and safe at avoiding valve dysfunction in small infants. This could be a new strategy to avoid reoperation in small children.

REFERENCES

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