Fast-tracking in Paediatric Cardiac Surgery  
A Retrospective Cohort Study

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ABSTRACT

Fast-tracking is an anaesthetic approach in paediatric cardiac surgery facilitating extubation within eight hours post-op and early transfer to HDU. A retrospective cohort study of 157 patients who underwent cardiac surgery over a six-month period at Alder Hey Children’s Hospital in Liverpool, England was conducted. Results showed a reduction in the incidence of post-op complications and length of ITU and total hospital stay.

INTRODUCTION

An estimated 4,600 babies are born each year with congenital heart disease1. The management of these patients has evolved substantially over the last four decades sustaining an upwards trend in survival rates2. Post-operatively these patients were traditionally intubated and ventilated in intensive care for prolonged periods. More recently an approach known as ‘fast-tracking’ has emerged. This anaesthetic method lacks clear definition, but is widely considered as extubation within eight hours of surgery and early admission to the high dependency unit3,4. Studies have shown, this fast-track method is not suitable for all patients, for example:

• Patients with single ventricle physiology
• Very low weight babies
• Neonates
• Procedures involving a long cardiopulmonary bypass (CPB)/aortic cross clamp time
• Cases requiring delayed chest closure
• Patients with intra-operative complications e.g. profound acidosis/haemodynamic instability.

STUDY JUSTIFICATION

Currently there is no protocol in place for fast-tracking at Alder Hey. Despite this it was hypothesised that a significant number of cases were being fast-tracked. A study was designed to review the incidence of fast-tracking. In addition the study also aimed to identify variables which may have influenced the anaesthetic approach employed and determine the incidence of post-op complications.

METHOD

A retrospective cohort study was undertaken of all patients who underwent cardiac surgery over a six month period between December 2009-May 2010.

RESULTS AND ANALYSIS

Study population: a total of 205 procedures were performed during this period. Sixteen cases were associated with intra or post-op mortality—these medical notes were unavailable for analysis. A further 25 case notes were unavailable and seven patients were transferred immediately post-operatively to other hospitals, consequently data was incomplete and these cases were excluded. A total of 157 case notes were analysed.

Ages ranged between 2days and 19years of age, with weights from 1.8-58Kg. 33% of patients in the study were fast tracked. 29 patients (16 CPB and 13 non-CPB) were extubated in theatre or upon arrival in PICU (age range 2days-19yrs). A further 23 were extubated within hours post-op. 33% met the fast-track definition. There was no significant difference in re-intubation rates between the two groups.

The incidence of post-operative complications was 33% in the fast-track cases compared to 54% in the conventionally managed group.

DISCUSSION

Data collection was performed by a single researcher, enhancing consistency. The exclusion rate was relatively high at 23.4% (48 patients). Exclusion of deceased patients prevents any discussion of mortality rates and affects the validity of the discussion in relation complications between the two groups. It is possible that more researchers and a longer data collection period would have enabled missing case-notes to have been located, increasing the data yield.

Results show a reduction in the overall incidence of post-op complications and length of ITU and total hospital stay in the fast-track group. A significant cross-over effect is expected between the variables studied. The results may be attributed to fast-tracking as a superior anaesthetic approach in this cohort, or may be an epiphenomenon due to the cross-over effect. For example patients with more complex congenital abnormalities are more likely to undergo surgery at a younger age and lower weight and therefore be less stable pre, peri and post-operatively.

CONCLUSION

This retrospective study appears to support previous research findings. When the appropriate patients are identified, fast-tracking can result in fewer post-operative complications and an overall improved outcome for the child. This demonstrated that a protocol and care pathway is required to guide practice, support the MDT and ensure consistency.

The results of this study can only be viewed as evidence of the need for further, more extensive research. A large multicentre randomised control trial would be most appropriate to conclusively evaluate the efficacy of fast-tracking in comparison to the traditional management approach.

REFERENCES