Physiotherapy for patients following coronary artery bypass graft (CABG) surgery: Limited uptake of evidence into practice

Filbay SR, Hayes K and Holland AE (2011) Physiotherapy for patients following coronary artery bypass graft (CABG) surgery: Limited uptake of evidence into practice. Physiotherapy Theory and Practice [Epub ahead of print, DOI: 10.3109/09593985.2011.582231] (Abstract prepared by E Dianne Body)

Aim

To identify current physiotherapy interventions in use in Australia and New Zealand for patients who had undergone uncomplicated CABG surgery and to evaluate these practices to determine if they are supported by current evidence. The results were compared to an earlier similar study (Tucker et al 1996) to see if the uptake of evidence-based practice had increased.

Introduction

Research indicates physiotherapy interventions that have no benefit following uncomplicated CABG surgery include treatment during the intubation period, deep breathing exercises (DBE), percussion, incentive spirometry, intermittent positive pressure breathing and continuous positive airway pressure. Techniques shown to be of benefit include positive expiratory pressure (PEP), early and progressive mobilisation and walking training. Upper limb and thoracic range of movement exercises have shown some benefits but results are inconsistent across trials. Tucker et al (1996) found that 94% of respondents reported using DBEs despite evidence suggesting the technique did not improve outcomes in uncomplicated patients. References to seven studies since then support these findings.

Methods

A prospective survey in the form of a questionnaire was sent to senior cardiothoracic physiotherapists in every hospital in Australia and New Zealand that performs CABG surgery. The questions were based on a 2009 literature review by the authors and structured to approximate the survey carried out by Tucker et al (1996) to allow comparison. The questionnaire related to techniques of treatment, factors influencing choice of treatment and level of experience of respondents.

Results

A total of 53 surveys were included in the analysis; 25 were from public hospitals, 27 from private hospitals and one from a physiotherapist who worked in both settings. Ten surveys were returned from New Zealand. The majority of respondents (38) had been in the workforce force for longer than six years.

Responses from 36 physiotherapists (68%) indicated that all CABG patients were assessed and treated. Fifteen reported assessing all patients but only treating if indicated. Most patients were seen once a day but 36% were seen twice daily in the early stages; patients were seen on the first postoperative day by 96% of physiotherapists. Physiotherapists in three hospitals treated uncomplicated intubated patients and one performed manual and ventilator hyperinflation prior to extubation.

All hospitals included walking as a postoperative treatment, generally implemented by physiotherapists. Assessment of patients' safety on stairs was undertaken in 96% of hospitals, and was always carried out by physiotherapists. Home exercise programmes, upper limb and trunk exercises were prescribed by most physiotherapists. Clinical care pathways were used by 91%. Physiotherapists' experience was perceived as the most influential factor in determining postoperative management and respondents with a postgraduate degree were less likely to use breathing and coughing techniques ($p = 0.045$). When asked to identify specific literature that related to post-CABG physiotherapy intervention, 63% could name at least one paper with articles on DBE being the most common.

Conclusion

Knowledge of current literature does not ensure that recommendations are carried into clinical practice. Research findings indicate that DBE and incentive spirometry provide no benefit over early and progressive mobilisation following uncomplicated CABG surgery. Despite this evidence, 77% of physiotherapists use DBE with their patients and 40% use incentive spirometry. The results indicate a need to facilitate evidence-based treatment into physiotherapy management.

Commentary

This paper raises awareness of the apparently limited uptake of evidence into practice by physiotherapists who have knowledge of pertinent cardiothoracic research. Contemporary evidence indicates that prophylactic chest physiotherapy makes little difference to patient outcomes (Reeve and Ewan 2005). The challenge is in predicting which patients will develop a clinically significant postoperative pulmonary complication (PPC), as there is no reliable tool that can be applied at the preoperative assessment.

The abstract, introduction and research references refer to physiotherapy interventions following uncomplicated CABG surgery, as does the questionnaire and findings published by Tucker et al (1996). However, the paper does not define "uncomplicated" but does give some examples of PPCs. As such, while the surgery may have been considered uncomplicated, some patients may have comorbidities or develop complications after the surgery, with the PPC following cardiac surgery reported as 7.5% (Stiller et al 1994). The questionnaire includes the words "routine" or "routinely" five times and these descriptors appear in the paper eleven times, in the context of routine patients or routinely providing an intervention. This is cause for unease as patients should be assessed and treated according to clinical reasoning based on findings, not according to a routine.

The aspect of physiotherapy intervention that research has shown to be of greatest benefit is early and progressive mobilisation and walking. Walking more often and for longer periods helps patients to achieve functional milestones more quickly, cope better with walking after discharge and have greater satisfaction with their treatment than patients who walk less. When patients mobilise their ventilation perfusion match is optimised, tidal volume will increase and respiratory rate will rise. Therefore, it is logical that mobilising is an effective method of ensuring deep, effective breathing. The paper also reports that PEP therapy using a blow bottle device reduces atelectasis and improves respiratory function compared to controls performing DBE or controls not treated. Physiotherapists may provide more effective treatment by replacing incentive spirometers with PEP devices.

The authors acknowledge limitations to this study. The questionnaire had undergone only limited pilot testing. Information that could be compared to that of Tucker et al (1996) was sought but a different survey instrument used. Only the most senior cardiorespiratory physiotherapist in each institution was invited to participate which may not have provided a true reflection of practice at the hospital.

Education was not specifically mentioned in the questionnaire. An important component of physiotherapy management is motivating and encouraging the patient to make healthy lifestyle choices and providing acceptable suggestions for ongoing exercise and rehabilitation. It is

vital to progress physiotherapy methods based on evidence-based practice but the value of practice-based evidence should not be under estimated.

Dianne Body, NZRP
Dip Phty, PG Cert Clin Tchg, PG Cert Cardiac Rehab.

REFERENCES

Reeve J and Ewan S (2005) The physiotherapy management of the coronary artery bypass graft patient. *Journal of the Association of Chartered Physiotherapists in Respiratory Care* 37: 35-44.

Stiller K, Montarello J, Wallace M, Daff M, Grant R, Jenkins S, Hall B and Yates H (1994) Efficacy of breathing and coughing exercises in the prevention of pulmonary complications after coronary artery surgery. *Chest* 3:741-747.

Tucker B, Jenkins S, Davies K, McGann R, Waddell J, King R, Kirby V and Lloyd C (1996) The physiotherapy management of patients undergoing coronary artery surgery: A questionnaire survey. *Australian Journal of Physiotherapy* 42: 129-137.