SHORT REPORT

Audit of cardiac catheterisation in a DGH: implications for training and patient safety

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We present an investigation into the safety of providing training in coronary angiography within a district general hospital setting.

Introduction

In the modern era, patient safety has become one of the most important issues facing doctors and institutions. Cardiology is a craft speciality. Procedures must be learnt by trainees, but there is a risk, in so doing, of harming patients.

The purpose of this study was to ask whether it is possible, albeit within a single institution, to provide training in coronary angiography at a district general hospital (DGH) without causing harm, by comparing the complication rate of trainees with consultants in a large case series.

Methods

Between August 2010 and December 2013, procedural complications resulting from cardiac catheterisation at Chesterfield Royal Hospital were recorded in a prospective registry. Major complications were defined as stroke, perforation of a cardiac chamber, coronary dissection, coronary occlusion or pseudoaneurysm of a peripheral vessel requiring intervention, or any complication requiring admission. All other complications were minor.

For statistical analysis, cases were divided into trainee-led and consultant-led groups. Comparisons were made using Chi-squared and student *t*-tests as appropriate.

Results

A total of 1,526 diagnostic angiograms were performed: 1,203 (78.8%) consultant-led and 323 (21.2%) trainee-led. Access was via the femoral artery in 1,490 (97.7%) cases and the radial artery in 36 (2.3%) cases. Patient demographics in both groups were comparable (**table 1**). Five patients were admitted following

Table 1. Patient demographics and procedural complications

	Consultant (n=1,203)	Trainee (ST3) (n=323)	p value
Age, years	64.7 ± 9.4	65.8 ± 9.9	NS
Gender, % male	65.6%	69.1%	NS
BMI, kg/m^2	29.2 ± 5.1	28.8 ± 5.2	NS
Minor complications, n (%)	**45 (3.7%)**	**14 (4.3%)**	**NS**
Haematoma	20 (1.7%)	6 (1.9%)	NS
Ultrasound scans	11 (0.9%)	2 (0.6%)	NS
Vasovagal episodes	14 (1.1%)	6 (1.9%)	NS
Major complications, n (%)	**3 (0.3%)**	**2 (0.6%)**	**NS**
Anaphylaxis	1 (0.1%)	1 (0.3%)	NS
Stroke	1 (0.1%)	0	NS
Pseudoaneurysm	1 (0.1%)	1 (0.3%)	NS
Myocardial infarction	0	0	
Death	0	0	
Admissions, n (%)	3 (0.2%)	2 (0.6%)	NS

Key: BMI = body mass index; NS = not significant

catheterisation: two suffered anaphylactic contrast reactions and one a stroke. There were no deaths. There were 26 vascular access complications observed: 13 patients were referred for ultrasound examination and two pseudoaneurysms required injection. There were no significant differences in complication rates between consultant-led and trainee-led cases.

Discussion

There is evidence that outcomes following percutaneous coronary intervention (PCI), and angiography without PCI, are better with more experienced operators and, therefore, by implication, inexperience can result in patient harm.[1-4] However, results from two recent single-centre studies suggest that close senior supervision of less experienced operators may reduce the increased patient risk associated with inexperience.[5,6]

The last decade has seen training in coronary angiography move from the regional centres to the DGH. The safety implications of this shift have not been examined. In this prospective audit, we set out to examine the effect on patient risk of training inexperienced operators in diagnostic angiography in a DGH.

Over the period reported, six trainees each performed their first 50 cases of coronary angiography under direct consultant supervision. Complication rates reported here compare well with previously published registries.[6,7] We did not monitor renal function or collect data on the volume of contrast used. However, these data show that diagnostic cardiac catheterisation is a safe procedure and that the training of inexperience operators does not expose patients to increased clinical risk

Conflict of interest

None declared.

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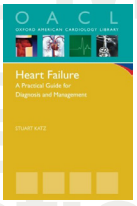
Book review

Heart failure: a practical guide for diagnosis and management



Author: Katz S
Publisher: Oxford American Cardiology Library, 2013
ISBN: 978-0-19-991708-2
Price: £22.99

This is a concise handbook on all aspects of heart failure diagnosis and management which any healthcare professional is likely to need. It will easily fit into your work bag and be available for when those inevitable questions arise, based on up-to-date clinical guidelines from the American Heart Association, American College of Cardiology, Heart Failure Society of America, Canadian Cardiovascular Society and the European Society of Cardiology. However, what Stuart Katz does so effectively is to flesh out the latest evidence in a narrative that can be followed and easily understood.

The book is short and can be read in one dedicated session. The chapters allow the different elements of the clinical management of heart failure to be navigated with ease. Each chapter provides a brief synopsis of the key learning points at the start of the section, allowing even easier access. The chapters provide detailed information, while diagrams and graphs are used frequently to articulate specific points in detail. These graphs are normally quite small and in black and white, two factors which can make them difficult to understand.

Certain points are underplayed and may well have benefitted from a little more information. For example, cardiac resynchronisation therapy is only discussed briefly in two paragraphs and, I thought, might have warranted more detail.

Overall this book is a great companion for those healthcare professionals who are involved in the diagnosis and treatment of heart failure. Its concise nature, well-organised presentation and straightforward narrative provide all the detail of international evidence-based guidelines in a very effective manner. This book will find itself sitting in my on-call bag, for those annoying heart failure questions that pop up when we least expect them.

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