

MRC/BJA Fellowship Abstract

Over two million surgical procedures are carried in the UK every year. 2% of patients will die and many more will suffer a complication following surgery. Some of the most common complications are cardiovascular in origin. New data suggest that 1 in 10 patients will suffer asymptomatic myocardial injury, defined by a transient rise in cardiac troponins. These patients are more likely to die or suffer a myocardial infarction. However, the mechanism of perioperative myocardial injury is poorly understood. Many studies have examined treatment and prevention strategies for cardiac complications after surgery, but with little success. A number of trials found that controlling perioperative heart rate with beta-blockers reduces the risk of myocardial infarction, but this is at the expense of an increased risk of strokes, hypotensive episodes and death. These trials did not target drug therapy to specific heart rate thresholds because the relationship between perioperative heart rate and outcome has not been studied in detail. I hypothesise that perioperative tachycardia is independently associated with postoperative myocardial injury, which is in turn associated with myocardial infarction and death.

My PhD aims to illicit heart rate thresholds associated with myocardial injury, myocardial infarction and death. I will use epidemiological methods to study four highly detailed perioperative databases, starting with a large international multi-centre dataset. I will then re-test these findings in two smaller and highly detailed databases. I will also examine whether change in heart rate during preoperative exercise is associated with the outcome measures, using data from a large international observational cohort study.

My results could inform the design of future clinical trials of perioperative heart rate therapy and develop clinical practice regarding the management of tachycardia.

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