Disruption of blood sugar levels after heart surgery is common

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A study reveals today that inadequate blood sugar control in patients having heart surgery is associated with a four fold increase in post-surgery death and major complications - and that the blood sugar disturbances occur in patients with and without diabetes.

The research from the University of Bristol was funded by the British Heart Foundation (BHF) and Garfield Weston Trust and is published today in *Circulation*. The study involved nearly 9,000 patients and showed that disturbed blood sugar control occurred not only in known diabetics, but that more than half of heart patients who developed moderate to poor blood sugar control post-surgery were not thought to be diabetic.

Diabetes has long been associated with a poor clinical outcome following heart surgery and there have been a number of advances in operative and intensive care techniques for diabetic heart patients. These findings have new and major implications for the treatment of heart patients as they suggest that inadequate control of blood sugar irrespective of diabetes mellitus is associated with four-fold increase of in-hospital mortality and major complications including heart attack (2.7 fold increase), neurological, kidney, lung and gastrointestinal injury.

The study, led by Dr Raimondo Ascione, Reader and Consultant in Cardiac Surgery at the Bristol Heart Institute, urges surgeons and intensive care specialists to use strict protocols of active blood sugar control in all patients admitted for major surgery. The effectiveness of

these protocols and the biological mechanisms that lead to this problem also need to be investigated with rigorous research.

Dr Ascione said: "Currently, the absence of recognised guidelines is creating confusion on how to face the challenge of clinical conditions other than diabetes leading to derangement of glucose metabolism. The lack of rigorous research in this field does not help.

"Important clinical decisions are often left to the individual clinician. These include: which screening tests, if any, to use on admission; whether or not to use a blood glucose control strategy during hospital stay, which level of blood glucose to target, and whether this targeting has to be strict or lenient."

This confusion has resulted in:

a lack of consistency worldwide in defining glucose metabolism-related conditions other than diabetes such as undiagnosed diabetes, stress hyperglycaemia, and inadequate blood glucose control;

- a marked difference in assessing the extent of the problem (for example, in the United States, the prevalence of diabetes in patients undergoing coronary artery bypass graft is 35 to 40 per cent but in the UK it is only 18 to 20 per cent - almost certainly an underestimate because many diabetics are undiagnosed; nevertheless, in both countries these numbers do not take into account the condition of inadequate BGC irrespective of diabetes);
- significant discrepancy in the treatment of patients, often even within the same unit, the impact of which remains uncertain.

Dr Ascione continued: "We believe that the findings of our study might apply also to all those non-cardiac surgery patients

admitted for any other major surgical procedure worldwide. This might have serious implications for patients life expectancy and place an enormous burden on hospital resources."

Professor Peter Weissberg, Medical Director of the BHF, who co-funded the study, said: "While previous research has shown blood sugar levels have an important impact on the outcome of patients suffering a heart attack, this study shows for the first time the same may also be true for patients undergoing heart surgery.

"This research provides the basis for further, in depth studies to try to understand how better sugar control can help save more lives during and after heart surgery."

Source: University of Bristol