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New Treatment Method Possible in Cardiac Surgery

A joint clinical trial conducted by the University Hospital and the University of Gothenburg, Sweden, found that an element in human blood, fibrinogen, is likely more vital to the blood's clotting ability in connection with heart surgery than previously considered. If the patients also receive a dose of fibrinogen prior to the procedure, this reduces the risk of haemorrhage during and after surgery. These results may open the door to new strategies in reducing bleeding complications in cardiac surgery.

Each year over 7,000 Swedes undergo open-heart surgery, most commonly a coronary artery bypass or a valve replacement. It's a major procedure during which the heart and lungs are stopped and their functions are temporarily replaced by a heart-lung machine, or CPB pump.

"But the use of a CPB pump has negative effects on the blood's clotting ability, and those effects last a few hours after the operation," says Dr Martin Karlsson at Sahlgrenska Academy at the University of Gothenburg, Author of the thesis. "This leads to a risk of bleeding. It's unclear why certain patients have more problems than others, but several factors may be involved."

Fibrinogen is one of the most important coagulation proteins in our blood, and the thesis shows that the amount of fibrinogen in the blood is more important than previously thought to ensure clotting after heart surgery.

"We found that the amount of fibrinogen in the patient's blood immediately prior to bypass surgery is directly related to how much the patient bleeds afterwards, and also to the need for blood transfusions after surgery. As a rule, patients with lower levels of fibrinogen in their blood prior to surgery bleed more, even if they have levels that were previously perceived as normal and sufficient."

In one part of the trial, bypass patients with low levels of natural fibrinogen in their blood were pre-treated with fibrinogen concentrate before the operation. This reduced the amount of bleeding and the need for transfusions during and after surgery compared with a control group, and the pre-treated patients showed no signs of side effects.

"Treatments such as this have never been tried on patients before, and this trial was only a pilot study, with a small number of patients," Karlsson explains. "So it's too early to draw any real conclusions, but the results are promising and larger trials have already begun."

Karlsson hopes that if the results of the pilot study can be confirmed, then fibrinogen concentrate could be used as a preventive therapy for patients about to undergo a surgical procedure and in other instances where the risk of haemorrhage is high. This would offer a new treatment option for the large number of patients undergoing cardiac surgery each year, possibly also for other surgical procedures.

Source: Clinical and Applied Thrombosis/Hemostasis, 2010