Beta blockers can kill during surgery

Doctors should administer beta blockers to heart patients during surgery in a more nuanced way than previously believed. Incorrect use can have no effect and can in the worst case cost lives.

International guidelines recommend that patients with heart disease should be administered beta blockers prior to noncardiac surgery such as knee or hip replacement surgery. Beta blockers relieve stress on the already fragile heart by lowering the blood pressure and stabilising the heart rhythm.

Now a new Danish study, published in the journal *JAMA Internal Medicine*, suggests that patients with a weakened heart, also known as ischemic heart disease, require different treatment with beta blockers depending on the cause of their heart disease when they undergo noncardiac surgery.

In some cardiac patients, the beta blockers can lower the blood pressure in undesirable ways and can increase the risk of dying.

"In terms of beta blockers, we have been treating all cardiac patients in the same way when they underwent noncardiac surgery," says the first author of the study, Charlotte Andersson, a postdoc fellow at the Gentofte University Hospital.

"However, our research indicates that the treatment should be based on the needs of the individual patient; otherwise it could increase the risk of death."

**Cause of ischemic stroke is important**

The research group, consisting of scientists from the University of Southern Denmark, Copenhagen University, Aalborg University and Stanford University in the US, looked at data from 28,263 patients with ischemic heart disease to assess the association of beta blocker treatment with major cardiovascular adverse events (MACE) and all-cause mortality in patients with ischemic heart disease undergoing noncardiac surgery.

MACE covers ischemic stroke, myocardial infarction, or cardiovascular death.

The team also examined whether or not the patients had been given beta blockers prior to surgery. The results revealed a diverse pattern associated with the cause of the weakened heart.

- In the sickest heart failure patients and those who had recently suffered myocardial infarction, there was a reduced risk of MACE when using beta blockers.
- In patients who had suffered myocardial infarction more than two years ago, the beta blockers had no effect.
- However, patients who only suffered arteriosclerosis and not heart failure or recent ischemic stroke, an increased risk of MACE and death was associated with the use of beta blockers.

"In some cases, the beta blockers either save lives or make no difference, and in other cases they may lead to
an increased mortality among patients with a weakened heart,” says Andersson.

**Personalised treatment is the key**

Beta blockers appear to be a problem for heart patients, as they may cause an unwanted lowering of the patient’s blood pressure during surgery, where the blood pressure is lowered automatically when the patient bleeds.

"It is a difficult balance to strike since on the one hand, beta blockers have a protective effect on heart patients, and on the other hand they can cause an unwanted lowering of their blood pressure,” says the researcher.

The new study thus indicates that doctors should base their treatment on the needs of each individual patient when administering beta blockers during surgery.

"Those who have a high risk of getting a blood clot or heart failure in connection with surgery can benefit from using beta blockers, but with other patients it would make sense to be more restrictive.”

**More solid studies needed**

Although the new study can be considered as something of a breakthrough in medical circles, further studies are needed before any firm conclusions can be drawn.

"Our study is an observational study, so it makes sense to be careful not to jump to conclusions. There may be other factors in the observed effects that cannot be controlled,” says Andersson.

Previous research in this field has primarily focused on people who already had a low risk of MACE in connection with surgery.

“What we are trying to say with this study is that there is a need for clinical studies in which these factors are carefully controlled, and where the focus is on the sickest patients, because we actually don’t know how these should be treated.”

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Read the Danish version of this article at videnskab.dk [9]


Fact box

Ischemic heart disease is a spectrum of diseases of the heart caused by decreased oxygen supply to the muscle of the heart.

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Charlotte Andersson

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Charlotte Andersson

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