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Anaesthesia: optimum ventilation strategy during general anaesthesia in abdominal operations found

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A multi-centre study at 30 centres across Europe, North and South America involving a total of 900 test subjects has investigated various ventilation strategies currently used during anaesthesia given for surgical procedures involving the abdomen to see just how effective they are. The MedUni Vienna's Clinical Department of Cardiothoracic and Vascular Anaesthesia and Intensive Care (HTG) was involved in the study.

In Austria, Werner Schmid and Christian Weiss from the Clinical Department of Cardiothoracic and Vascular Anaesthesia and Intensive Care (HTG) at the MedUni Vienna, led by Prof. Hiesmayr, were involved in carrying out the study. As members of the management committee, Jörg Hiesmayr and Edda Tschernko from the University Department of Anaesthesia, Intensive Care and Pain Therapy at the MedUni Vienna played a key role in planning this largest randomised controlled study ever carried out in patients receiving mechanical ventilation while under general anaesthetic.

"We have been able to demonstrate for the first time that a form of ventilation with high pressure ratios does not lead to an improvement in the patient's post-operative progress," says Werner Schmid from the University Department of Anaesthesia, Intensive Care and Pain Therapy, summing up the findings of the study. The study has now been published in the highly respected journal "*The Lancet*".

During procedures involving the abdominal cavity, mechanical ventilation of the lungs under general anaesthesia is controlled using the positive end-expiratory pressure (PEEP). PEEP keeps the lungs and alveoli open at the end of each respiratory cycle. The influence of different PEEP levels on the patient's post-operative progress has so far been unknown. Until now, it was assumed that a high PEEP prevents the alveoli from collapsing and therefore would reduce the occurrence of post-operative lung complications.

The current study has now investigated the influence that a high PEEP level of 12 cm of H2O has compared to a low PEEP of less than 2 cm of H2O on the frequency of post-operative complications and therefore the progress of the condition following surgery to the abdomen.

The result: "An increase in pressure is not expedient," says Schmid. "During procedures carried out with a higher ventilation pressure, patients more frequently had drops in blood pressure and therefore also required blood pressure-raising medications. It was also not possible to achieve the reduced risk of post-operative lung complications that we had actually hoped for." Additional measures aimed at reopening alveoli during surgery also failed to yield the desired improvement.

A reduction in the ventilation pressure to 2 cm H2O, on the other hand, is gentler on patients - the risk of complications is just as high as with high PEEP, although there is a less marked effect on the cardiovascular system. Says Schmid: "Optimum ventilation that protects the lungs should therefore include a low breath volume with low PEEP without additional measures to open the alveoli."

Says Hiesmayr: "The PROVILHO study has the magnitude and potential to have a major influence on future guidelines for mechanical ventilation during surgical procedures and is an example of how cooperation can work on a large and small scale; without the support of the entire HTG

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team, this work would not have been possible."

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