Physical Inactivity After Cardiac Surgery Linked With Substantially Higher Risk Of Depression

New research indicates that inactive patients following cardiac surgery have a substantially higher risk of depression and that the number of patients suffering from depression after cardiac surgery is as high as 40 percent. Investigators recommend that cardiac patients should be assessed for depression and level of physical activity and remain as active as they safely can after surgery to minimize post-operative depression. The results are published in the December issue of the Canadian Journal of Cardiology.

Major depressive disorder is an independent risk factor for the development of coronary artery disease (CAD) and increases the risk of cardiac events and premature death. Prevalence estimates of depression among patients with CAD requiring cardiac surgery ranges from 23% and 47%, which is higher than the general CAD population, including those who have had a heart attack, and is nearly twice as common as in the general population without cardiac disease. Approximately half of patients suffering from depression before cardiac surgery remain depressed one year after surgery, and an additional 20% of patients who undergo coronary artery bypass grafting experience new or elevated depressive symptoms after surgery. Moderate to severe depression after cardiac surgery increases the risk of further cardiac complications.

Evidence describing the change in physical activity status before and after cardiac surgery, and whether physical activity status is associated with depressive symptoms following surgery, is limited. Investigators from the University of Manitoba therefore sought to define who is at risk for depression after surgery, whether all patients experience similar mood changes, how and when physical activity changes, and how this affects depression after surgery. They conducted the Impact of Physical Activity on Depression After Cardiac Surgery (IPAD-CS) study to assess 436 patients who were undergoing elective cardiac surgery or awaiting in-hospital cardiac surgery requiring cardiopulmonary bypass in 2010-2011. Patients were assessed for short-term depression and physical activity behavior before surgery, at hospital discharge, and three and six months after surgery. Patients were categorized as "depression naïve," "at risk," or "depressed" before surgery and as physically "inactive" or "active" based on their activities over the preceding seven days.

Results show that physical inactivity was an independent risk factor for increased depressive symptoms before surgery and that inactive patients had double the risk of experiencing depressive symptoms preoperatively. Preoperative depression and postoperative stressful events were the strongest associations after surgery. Physical inactivity was associated with preoperative depression and new depression six months after surgery. Strikingly, the investigators found that 58% of the "at-risk" group progressed to clinical depression after surgery compared to 28% in the

"naive" group, and that 23% remained depressed after six months. Furthermore, stressful events (e.g., death in family, divorce, living alone) became significantly associated with depression at three and six months after surgery, suggesting that factors predisposing patients with cardiac disease to elevated symptoms of depression are not fixed and vary over time.

A subgroup of patients who were not depressed at baseline ("naive" plus "at-risk" subgroups), but who became depressed by the three- or six-month follow-up, demonstrated a significant decrease in physical activity from baseline to six-month follow-up compared to those who remained free from depression.

One caveat the investigators point out is whether reduced physical activity increased depressive symptoms or, conversely, if depression resulted in sedentary behavior.

Antidepressant medications remain the mainstay of current depression treatment strategies. However, their use is controversial in patients with coronary artery disease. Previous studies have shown that exercise as a treatment among patients with coronary artery disease is as effective as antidepressants for reducing depressive symptoms. However, it is not yet known if physical activity has a similar effect in patients undergoing cardiac surgery who already have depression.

"Depression in the patient undergoing cardiac surgery appears complex," says lead investigators Rakesh C. Arora, MD, PhD (Faculty of Medicine, Department of Surgery, University of Manitoba, Winnipeg) and Todd Duhamel, PhD (Faculty of Kinesiology and Recreational Management, University of Manitoba, Winnipeg). "We have identified that although seven independent factors are associated with depression before and after cardiac surgery, different mood responses in different subsets of patients exist. Furthermore, patients 'at risk' for depression represent a new high-risk subset. Preoperative physical inactivity independently poses a two-fold risk for depression before surgery and is associated with the development of new depression postoperatively.

"These findings justify more detailed assessments of depression and physical activity before, during, and after surgery, and the need for assisted bio-psycho-social support in patients undergoing cardiac surgery," they conclude.

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