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Should Thiamine Nutritional Status Be Screened Prior To Open Heart Surgery?

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Background:

Thiamine is a crucial factor in carbohydrates metabolism. Its deficiency affects several organ systems, and symptoms may range from mild to severe, life-threatening disease. Impaired thiamine status is increasingly being recognized in non-alcoholic patients. The purpose of this study was to evaluate the prevalence of thiamine deficiency, associated risk factors and adverse consequences among patients undergoing open heart surgery.

Methods and Results:

Eighty-nine adult patients undergoing elective cardiac surgery were enrolled prospectively. Low preoperative thiamine level was defined as 70 nmol/L. Of the 89 patients evaluated, 17 (19.1%) had low thiamine levels;thesepatients weremore likely to benon-smokers (70.6% vs. 41.7%; p=0.03), and demonstrated lower albumin levels (r=0.242; p=0.022), higher creatinine levels (r=-0.252; p=0.017), greater use of diuretics (58.8% vs. 22.2%; p=0.005) and statins (88.2% vs. 62.5%; p=0.035), and had a trend towards higher than median (8.39) STS score (p=0.06). Age, gender, BMI, hemoglobin A1C, urinary albumin to creatinine ratio, NYHA, ejection fraction, and coronary artery disease severity did not significantly differ between groups. A composite endpoint of death, multiple organ failure, severe wound infection, prolonged intubation, delirium, septicemia, pneumonia, renal failure, MI, cardiac arrest, CVA, and need for reoperation due to intractable bleeding occurred more frequently in thiamine deficient patients (64.7% vs. 30.6%; p=0.01). Individual endpoints were analyzed separately, finding only an increase in renal failure in thiamine deficient patients (35.3% vs. 12.5%; p=0.035). There were no differences in postoperative atrial fibrillation rates, readmissions and total length of stay.

Conclusions:

Thiamine levels 70 nmol/L may be prevalent in patients undergoing open heart surgery, and could therefore have a significant impact on combined adverse outcomes. More data are needed on the value of screening and supplementation of thiamine deficiency to improve these patient's outcomes.