RISK FACTORS

VITAMIN D LEVEL
AND SURGICAL RISK

Either a low or a high circulating level of vitamin D increases the risk of major adverse cardiac or cerebrovascular events (MACCE) after cardiac surgery. This finding comes from a new study performed by investigators at Ruhr University Bochum in Bad Oeynhausen, Germany (latitude 52°N).

Between January 2010 and August 2011, the researchers measured the circulating level of 25-hydroxyvitamin D [25(OH)D], in addition to 38 other parameters, in 4,418 consecutive patients scheduled to undergo cardiac surgery. A surprisingly high proportion of patients (38.0%) had a 25(OH)D deficiency (<30.0 nmol/l). A similar percentage (32.3%) had an insufficient 25(OH)D level (30.0–49.9 nmol/l), whereas 3.1% had a high 25(OH)D level (>100.0 nmol/l). Notably, the time of year seemed to be an important factor in determining 25(OH)D level, with winter being associated with deficient levels, and spring and summer being associated with adequate or high levels.

The incidence of postoperative MACCE—defined as in-hospital death, myocardial infarction, low cardiac output syndrome, or stroke—was 11.5%. Patients with a 25(OH)D deficiency, and those with an inadequate or high level of this vitamin had an odds ratio for MACCE of 2.23 (95% CI 1.31–3.79), 1.73 (95% CI 1.01–2.96), and 2.34 (95% CI 1.12–4.89), respectively, indicating a U-shaped relationship. The secondary end points of 6-month and 12-month mortality were higher in patients with a 25(OH)D deficiency than in those with a 25(OH)D level of 75.0–100.0 nmol/l.

These data suggest that the optimal 25(OH)D level is 75.0–87.5 nmol/l. Dr Armin Zittermann, lead author on the report, states that “there is an urgent need to prevent the high prevalence of deficient 25(OH)D levels in Central Europe, [which] can best be done by food fortification, supplement use, safe sun exposure, or a combination of these”. However, Dr Zittermann cautions that “until the causes for the U-shaped association of circulating 25(OH)D with poor clinical outcome are known, only moderate amounts of vitamin D should be used in supplements or food fortification”. The investigators would like “to perform a large randomized controlled trial in cardiac surgical patients to investigate whether the association between vitamin D deficiency and poor clinical outcome is causal”.

Gregory B. Lim

Original article Zittermann, A. *et al.* Vitamin D status and the risk of major adverse cardiac and cerebrovascular events in cardiac surgery. *Eur. Heart J.* doi:10.1093/eurheartj/ehs468