

Vitamin C demand is increased after total knee arthroplasty: a double-blind placebo-controlled-randomized study

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PURPOSE

This study was designed to determine whether perioperative supplementation of vitamin C (VC) improves range of motion (ROM) and reduces the risk of arthrofibrosis (AF) following total knee arthroplasty (TKA).

METHODS

Ninety-five patients undergoing TKA were randomized to either oral VC (1000 mg daily) or placebo for 50 days (48 VC group, 47 placebo group). The effect of VC supplementation was tested on ROM, AF, WOMAC, FJS-12, and VC plasma concentrations (VCc). VCc were analyzed in both patient groups before surgery, 4 and 7 days after surgery.

RESULTS

ROM at 1 year was not different between study groups. The prevalence of AF was 5 of 48 (10.4%) in the VC group compared to 11 of 47 (23.4%) in the placebo group ($p = 0.09$). VCc decreased post-operatively in the placebo group (49-12 $\mu\text{mol/l}$ on day 7, $p < 0.001$), but not in the VC group (53-57 $\mu\text{mol/l}$). Patients with a perioperative drop of VCc $\geq 30 \mu\text{mol/l}$ developed significantly more AF at 1 year compared to patients with a VCc drop of $< 30 \mu\text{mol/l}$ ($p = 0.007$).

CONCLUSIONS

TKA results in VC depletion. Perioperative VC supplementation prevents VCc drop in most patients undergoing TKA and may lower the incidence of AF. The clinical relevance of this study is that VC supplementation seems to be a cheap and safe adjunct to improve functional outcome after TKA.

LEVEL OF EVIDENCE

I.

TRIAL REGISTRY

The study was registered at the ISRCTN registry with study ID ISRCTN40250576.

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