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2-hour Oral Session

Prevention of surgical site infections: the holy grail of infection control

Targeting lower perioperative glucose levels to reduce surgical site infections without an increased risk of mortality or stroke - A systematic review and meta-analysis.

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Background: There is a distinct association between hyperglycaemia and surgical site infections. However, intensive glucose control to reduce the chance of hyperglycaemia is mostly feared due to the risk of hypoglycaemia with resulting severe complications. Therefore we systematically review studies comparing intensive glucose control protocols with conventional protocols in terms of reducing surgical site infections. Considering previous concerns regarding the risk of hypoglycaemia we also examined hypoglycaemia, mortality and strokes.

Material/methods: This review was conducted in line with the development of the Global Guidelines for prevention of surgical site infections commissioned by World Health Organisation (WHO) in Geneva. Pubmed, Embase, CENTRAL, Cinahl, World Health Organisation database and African Index Medicus between 01-01-1990 and 01-08-2015 were searched. Inclusion criteria were randomized controlled trials comparing intensive glucose control protocols with conventional protocols and reporting on the incidence of surgical site infections. Meta-analyses were performed with a random effect model and meta-regression was performed subsequently. We summarized blood glucose target levels, achieved blood glucose levels and important adverse events.

Results: Summary estimate showed a significant benefit of an intensive protocol over a conventional protocol in reducing surgical site infections, OR 0.48 (95% CI 0.33-0.69) $p=0.0001$. Meta-analysis of hypoglycaemic events showed a significant benefit of the conventional group (OR 4.18 (95% CI 1.79-9.79)) over the intensive group, however without an increased risk of mortality or strokes (OR 0.74 (95% 0.45-1.23) and OR 1.37 (95% CI 0.26-7.20) respectively). Meta-regression revealed that the benefit of an intensive protocol over a conventional protocol is consistent in both diabetic and non-diabetic patients and both intra- and postoperative. Moreover we found a benefit of an intensive protocol in reducing surgical site infections in both studies with an upper limit glucose level < 110 mg/dL and studies with an upper limit between 110 and 150 mg/dL. The majority of studies were performed in patients undergoing major surgical procedures with a postoperative ICU stay. There was considerable clinical heterogeneity between protocols used and patient populations.

Conclusions: Targeting stricter and lower blood glucose levels reduce surgical site infections. The summary data indicate that targeting glucose levels between 110-150 mg/dL in the perioperative period can be performed safely with a minimal risk of hypoglycaemic events but without a significant increase in serious adverse events.

Targeted and achieved blood glucose levels and SSI

