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A meta-analysis of outcomes following use of somatostatin and its analogues for the management of enterocutaneous fistulas

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Somatostatin is a naturally occurring peptide hormone. It has an inhibitory effect on gastrointestinal secretion[1]. Enterocutaneous fistulas (ECF) are abnormal communications between the gastrointestinal tract and the skin. Although rare, they are associated with considerable morbidity and mortality. Death related to ECF remains disproportionately high when compared with other surgical conditions. Mortality rates for ECF range from 6–33%[2]. Several randomised control trials (RCT) and studies have compared somatostatin and its analogues versus a control group in patients with ECF. The objective of this study is to meta-analyse the literature and establish if somatostatin and its analogues have a beneficial effect on ECF closure.

Comparative studies investigating the use of somatostatin and its analogues in the management of ECF were identified between January 1987 and March 2011. We searched the MEDLINE, EMBASE, CINAHL, Cochrane and PubMed databases according to PRISMA guidelines[3]. Seventy nine articles were screened. Nine RCTs met the inclusion criteria.

Statistical analyses were performed using Review Manager 5.1. For continuous data (time to closure of fistulas), the Inverse-Variance method was used for the combination of standardised mean differences (SMD). Binary data (number of fistulas closed and mortality) were summarised as risk ratios (RR) and combined using the Mantel-Haenszel method. 141 patients were in the analogue group with 147 controls. 82 patients were in the somatostatin group with 85 controls.

In comparing somatostatin analogues with control, six RCT reported on number of fistula closed. No significant heterogeneity was present and a significant number of ECF closed in the control group ($n = 77/155$) compared to analogue ($n = 100/152$) [Fixed effects model (FEM): RR = 1.36, 95% CI (1.12, 1.63), $z = 3.17$, $p = 0.002$]. Time to closure was reported in five RCT. No significant heterogeneity was present and ECF closed faster with analogues ($n = 141$) compared to controls ($n = 147$) [FEM: SMD = −0.51, 95% CI (−0.75, −0.28), $z = 4.27$, $p < 0.0001$]. Mortality was reported on in five RCT. There was no significant heterogeneity present and no significant difference between analogues ($n = 17/141$) and controls ($n = 21/147$) [FEM: RR = 0.89, 95% CI (0.50, 1.56), $z = 0.41$, $p = 0.68$].

In comparing somatostatin with control four RCT reported on number of fistula closed. There was significant heterogeneity, and hence FEM was inappropriate. A significant number of ECF closed with somatostatin ($n = 61/82$) as compared to control ($n = 30/85$) [Random effects model: RR = 2.79, 95% CI (1.03, 7.56), $z = 2.02$, $p = 0.04$]. Time to closure was reported by four RCT. There was no significant heterogeneity present and ECF closed significantly faster with somatostatin ($n = 82$) than controls ($n = 85$) [FEM: SMD = −0.79, 95% CI (−1.11, −0.47), $z = 4.86$, $p < 0.00001$]. Mortality was reported by four RCT. There was no significant heterogeneity evident and no significant difference was shown between somatostatin ($n = 4/82$) and controls ($n = 6/85$) [FEM: RR = 0.73, 95% CI (0.21, 2.59), $z = 0.48$, $p = 0.63$].

This meta-analysis suggests that somatostatin but not octreotide increases the likelihood of fistula closure. However both are beneficial in reducing the time to fistula closure. Neither has an effect on mortality.

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