

Gentamicin collagen sponges for the prevention of sternal wound infection: a meta-analysis of randomised controlled trials

M. Mavros, P. Mitsikostas, V. Alexiou, G. Peppas, M. Falagas* (Athens, GR)

Objectives: To determine if the application of gentamicin collagen sponges (GCS) reduces sternal wound infections (SWI) in cardiac surgery patients. **Methods:** Meta-analysis of randomized controlled trials (RCTs). **Results:** Four RCTs were eligible for inclusion. Pooling data from 4 RCTs (4672 per-protocol patients), GCS reduced deep SWI (relative risk [RR]=0.62, 95% confidence intervals [CI]: 0.39-0.97, $p=0.04$) and any SWI (RR=0.61 [0.39, 0.98], $p=0.04$). In contrast, no benefit was demonstrated regarding superficial SWI (4 RCTs, 4672 patients, RR=0.65 [0.34, 1.25], $p=0.20$) and all-cause mortality (3 RCTs, 3994 patients, RR=0.90 [0.57, 1.42], $p=0.66$). Based on data from 2 RCTs (3410 patients), GCS also appeared to reduce surgically treated SWI (RR=0.59 [0.41, 0.86], $p=0.005$). The most commonly isolated pathogens were coagulase-negative Staphylococcus spp. (38.8%) and *S. aureus* (29.8%). **Conclusion:** GCS appear to reduce SWI rate in cardiac surgery patients. The statistical heterogeneity among the existing trials underlines the need for additional large, high-quality RCTs.

Any SWI

Study or Subgroup	GCS		Control		Weight	Risk Ratio M-H, Random, 95% CI	Year	Risk Ratio M-H, Random, 95% CI
	Events	Total	Events	Total				
Eklund (Finland)	11	272	16	270	18.9%	0.68 [0.32, 1.44]	2005	
Friberg (Sweden)	42	983	87	967	30.8%	0.47 [0.33, 0.68]	2005	
Bennett-Guerrero (USA)	61	727	63	733	31.4%	0.98 [0.70, 1.37]	2010	
Schimmer (Germany)	9	353	24	367	18.9%	0.39 [0.18, 0.83]	2011	
Total (95% CI)		2335		2337	100.0%	0.61 [0.39, 0.98]		
Total events	123		190					
Heterogeneity: Tau ² = 0.15; Chi ² = 10.37, df = 3 (P = 0.02); I ² = 71%								
Test for overall effect: Z = 2.06 (P = 0.04)								

Deep SWI

Study or Subgroup	GCS		Control		Weight	Risk Ratio M-H, Random, 95% CI	Year	Risk Ratio M-H, Random, 95% CI
	Events	Total	Events	Total				
Friberg (Sweden)	23	983	32	967	45.9%	0.71 [0.42, 1.20]	2005	
Eklund (Finland)	5	272	8	270	14.7%	0.62 [0.21, 1.87]	2005	
Bennett-Guerrero (USA)	13	727	18	733	30.7%	0.73 [0.36, 1.48]	2010	
Schimmer (Germany)	2	353	13	367	8.6%	0.16 [0.04, 0.70]	2011	
Total (95% CI)		2335		2337	100.0%	0.62 [0.39, 0.97]		
Total events	43		71					
Heterogeneity: Tau ² = 0.04; Chi ² = 3.70, df = 3 (P = 0.30); I ² = 19%								
Test for overall effect: Z = 2.11 (P = 0.04)								

Superficial SWI

Study or Subgroup	GCS		Control		Weight	Risk Ratio M-H, Random, 95% CI	Year	Risk Ratio M-H, Random, 95% CI
	Events	Total	Events	Total				
Friberg (Sweden)	19	983	55	967	29.1%	0.34 [0.20, 0.57]	2005	
Eklund (Finland)	6	272	8	270	18.7%	0.74 [0.26, 2.12]	2005	
Bennett-Guerrero (USA)	48	727	45	733	31.5%	1.08 [0.73, 1.59]	2010	
Schimmer (Germany)	7	353	11	367	20.7%	0.66 [0.26, 1.69]	2011	
Total (95% CI)		2335		2337	100.0%	0.65 [0.34, 1.25]		
Total events	80		119					
Heterogeneity: Tau ² = 0.32; Chi ² = 12.28, df = 3 (P = 0.006); I ² = 76%								
Test for overall effect: Z = 1.29 (P = 0.20)								