# Relationship between nutritional status and mortality in adults on maintenance haemodialysis. A meta-analysis

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The aim of this systematic review was to determine the strength and direction of the association between body mass index (BMI), subjective global assessment (SGA) and mortality in adult patients on maintenance haemodialysis. Electronic data sources included Medline, Science Citation Index, Academic Search Premier, the Cochrane Library and Embase for the period 1963–2008. Data extraction and quality assessment were done by two independent reviewers. During meta-analysis of 12 studies reporting on BMI and four studies reporting on SGA results were pooled using the random effects model. Cochran's Q was used to identify heterogeneity. Higher levels of BMI were associated with a weak but significant reduction in overall mortality (log HR -0.0413, CI -0.0588 to -0.0237) with no significant difference between all-cause and cardiovascular mortality ($p = 0.4197$). The relationship between mortality and SGA was also not significant (log HR 0.0643, CI -0.1713 to 0.2999). A high degree of heterogeneity was found for both BMI and SGA. In conclusion, BMI showed a weak but significant inverse relationship with all-cause and cardiovascular mortality but the meta-analysis failed to confirm a significant relationship between SGA and mortality.

# The relationship between serum protein and mortality in adults on long-term haemodialysis. A meta-analysis

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The aim of this systematic review was to explore the relationship between serum protein and all-cause and cardiovascular mortality in adult patients on maintenance haemodialysis. We searched the Medline, Science Citation Index, Academic Search Premier, Cochrane Library and Embase electronic data bases. Data extraction and quality assessment were done independently by two reviewers and results were pooled using the random effects model. Cochran's Q was used to identify heterogeneity and a funnel plot was used for assessment of publication bias. A meta-analysis was performed on 38 studies reporting on serum proteins, inflammatory markers and mortality. A significant inverse relationship was found between serum albumin and all-cause [HR 0.7038 (CI 0.6367 to 0.7781)] and cardiovascular mortality [HR 0.8726 (CI 0.7909 to 0.9628)], with a significantly stronger relationship with all-cause mortality ($p = 0.0014$). Pooled results for C-reactive protein showed a weak but significant direct relationship with all-cause mortality (HR 1.0322; 95%CI 1.0151 to 1.0496) but not with cardiovascular mortality (HR 1.0172; 95%CI 0.9726 to 1.0639). A high degree of heterogeneity was identified between studies and an asymmetrical funnel plot for serum albumin is suggestive of publication bias. From the meta-analysis, it is concluded that serum albumin showed a significant inverse relationship with both all-cause and cardiovascular mortality, with C-reactive protein showing a significant direct relationship with all-cause mortality but not with cardiovascular mortality. The potential adverse effects of malnutrition and infections in relation to mortality highlight the need for continued treatment of infections and correction of malnutrition in dialysis patients.