

## Obesity protects inflamed dialysis patients

A high body mass index (BMI) is linked to longer survival terms for several serious chronic debilitating diseases. A large European epidemiological study shows that this protective effect does not apply to all patients with a high BMI. The findings, which are published in the *Journal of the American Society of Nephrology*, indicate that chronic inflammation plays an important part as confounder in this so-called "obesity paradox".

Obesity increases the risk of numerous diseases, such as type-2 diabetes, coronary heart disease, stroke, cancer, rheumatoid arthritis, Alzheimer and chronic kidney disease. Thus, high BMI has well-documented adverse effects on health. It therefore seem paradoxical for high BMI also to be linked to longer survival terms for the same chronic diseases for which it is a risk factor. This phenomenon has been called the "obesity paradox" has been observed for all the chronic diseases mentioned above. A common denominator of all the chronic diseases in which the obesity paradox has been described is the typical presence of persistent low-grade inflammation.

Time-updated all-cause (top), cardiovascular (middle) and non-cardiovascular (bottom) death by BMI (Q1-Q5) and Inflammation (present=red, absent=blue) in an unadjusted model (Model 0), following adjustment for demographics and medical history (Model 1) and following additional adjustment for modifiable factors (Model 2).

Researchers have now examined for the first time if inflammation influences the documented link between high BMI and survival in almost 6000 patients with severe kidney disease requiring dialysis treatment. About half of the patients showed signs of low-grade chronic inflammation.

Whereas it was demonstrated that high BMI had a protective action and was linked to longer survival rates for the dialysis patients with chronic inflammation no such protective effect of high BMI was found in dialysis patients who were inflammation free (Fig. 1). This correlation remains strong even after controlling for a large number of other factors that can influence survival rates for this patient group.

There are several reasons for why a high BMI could be protective in patients with chronic inflammation. At first, a high BMI can reflect stored nutrient reserves in the form of body fat and muscle mass and a good appetite, which are particularly important for people with severe kidney disease. The authors discuss that differences in the ability to repair damaged tissue with stem cells can also have some part to play in the observed association. Earlier studies have shown that the formation of new stem cells is inhibited by inflammation but boosted by fat mass.

Some limitations of this epidemiological study should be considered. Since BMI ( $\text{kg/m}^2$ ) is determined by both muscle and fat mass, it is a relatively poor measure of body composition. The study does therefore not say whether the protection for dialysis patients with chronic inflammation is provided by the higher amount of fat or muscle, or both. Thus, further studies to resolve the impact of body composition on outcome in inflamed and non-inflamed patient groups are needed.

Taken together, the implications of obesity in patients on dialysis carry differential prognostic information in those who are versus are not inflamed. The results of the study imply that overweight dialysis patients showing signs of chronic inflammation should not be recommended to lose weight. Treatment for inflamed patients, regardless of whether they are over- or underweight, should focus on resolving the inflammation and treating the underlying causes. Future studies should show if a high BMI also protects other patient groups with persistent low-grade inflammation, such as those with heart failure, stroke, dementia, type-2 diabetes, chronic pulmonary disease, rheumatism and cancer.

***Professor Peter Stenvinkel, MD, PhD***

*Department of Clinical Sciences, Intervention and Technology  
Division of Nephrology, Karolinska University Hospital  
Stockholm, Sweden*

**Publication**

[The Paradoxical Association Between Body Mass Index and Mortality in Hemodialysis patients is](#)

[Modified by Inflammation.](#)

Stenvinkel P, Gillespie IA, Tunks J, Addison J, Kronenberg F, Drueke TB, Marcelli D, Schernthaner G, Eckardt KU, Floege J, Froissart M, Anker SD on behalf the ARO Steering Committee  
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