

Brief note on role of Serum-C reactive protein in regular haemodialysis.

Kasapis Paul*

Department of Surgery, University of Maryland Medical System, Baltimore, Maryland, USA

Introduction

Regular hemodialysis is a life-saving therapy for individuals with end-stage renal disease (ESRD). However, patients undergoing hemodialysis are exposed to chronic inflammation due to multiple factors, such as the dialysis procedure itself, underlying comorbidities, and the presence of uremia. C-reactive protein (CRP), an acute-phase reactant, has emerged as a valuable biomarker to assess inflammation in hemodialysis patients. This article aims to provide a comprehensive review of the role of serum C-reactive protein in regular hemodialysis. Serum C-reactive protein (CRP) is a crucial biomarker widely used in medicine to assess the presence and severity of inflammation in the body. It belongs to the family of acute-phase reactants, which are proteins produced by the liver in response to various inflammatory stimuli, such as infection, tissue injury, or autoimmune disorders. CRP levels in the blood rise rapidly within a few hours after the onset of inflammation and fall rapidly when the inflammatory process resolves [1].

CRP measurement is a simple and cost-effective test that requires a blood sample. It is routinely used in clinical practice to aid in the diagnosis and monitoring of various medical conditions, including infections, cardiovascular diseases, autoimmune disorders, and malignancies. Elevated CRP levels have been associated with a higher risk of developing cardiovascular events, such as heart attacks and strokes. Moreover, CRP levels can provide valuable information about the presence and severity of infections, making it useful in guiding appropriate treatment strategies. Serum C-reactive protein serves as a reliable and sensitive indicator of inflammation, making it a valuable tool for clinicians in diagnosing and managing a wide range of medical conditions. Its ease of measurement and ability to reflect disease activity make CRP an indispensable biomarker in modern medical practice.

Hemodialysis and inflammation

Hemodialysis involves the extracorporeal removal of toxins and excess fluid from the blood, yet it also activates the immune system and promotes a pro-inflammatory state. This chronic inflammation in hemodialysis patients has been linked to increased morbidity and mortality. The factors contributing to inflammation include membrane bioincompatibility, oxidative stress, endotoxin exposure, and vascular access-related infections. These stimuli trigger the release of pro-

inflammatory cytokines and stimulate hepatic synthesis of acute-phase reactants, including C-reactive protein [2].

C-reactive protein

C-reactive protein is a pentameric protein primarily produced by hepatocytes in response to interleukin-6 (IL-6) and other pro-inflammatory cytokines. It is a sensitive and widely used biomarker for systemic inflammation. Serum CRP levels rise rapidly in response to tissue injury, infection, or inflammation and decline rapidly upon resolution of the inciting stimulus. CRP has been extensively studied in various medical conditions as a marker of inflammation and disease progression.

Serum-C reactive protein and mortality in hemodialysis patients

Multiple studies have demonstrated a significant association between elevated serum CRP levels and increased mortality in hemodialysis patients. Elevated CRP levels have been linked to cardiovascular events, infections, and malnutrition-inflammation complex syndrome (MICS). CRP levels have also been identified as an independent predictor of overall and cardiovascular mortality in this patient population. Monitoring CRP levels can aid in risk stratification and guide therapeutic interventions to mitigate the increased mortality risk [3].

Cardiovascular disease in hemodialysis

Cardiovascular disease is the leading cause of mortality in hemodialysis patients. Elevated CRP levels have been strongly associated with atherosclerosis, endothelial dysfunction, and increased cardiovascular events. CRP can serve as a prognostic marker for identifying high-risk patients who may benefit from aggressive cardiovascular risk factor modification and adjunctive therapies [4].

Infectious complications in hemodialysis

Infections are a major cause of morbidity and mortality in hemodialysis patients. Serum CRP levels have been investigated as a potential marker for identifying patients at risk of infectious complications. Elevated CRP levels have been associated with the development of catheter-related bloodstream infections, peritonitis in peritoneal dialysis, and sepsis. Monitoring CRP levels can assist in the early detection and management of infections in these vulnerable patients.

Hemodialysis patients

Hemodialysis patients often suffer from malnutrition and inflammation, collectively known as MICS. Serum CRP levels

*Correspondence to: Kasapis Paul, Department of Surgery, University of Maryland Medical System, Baltimore, Maryland, USA, E-mail: kasapis.paul@edu.org.usa

Received: 30-Jun-2023, Manuscript No. AAINM-23-107312; Editor assigned: 03-Jul-2023, PreQC No. AAPMT-23-107312(PQ); Reviewed: 17-Jul-2023, QC No. AAPMT-23-107312; Revised: 21-Jul-2023, Manuscript No. AAPMT-23-107312(R); Published: 28-Jul-2023, DOI: 10.35841/ainm-7.4.158

have been linked to markers of malnutrition, such as low albumin levels, hypocholesterolemia, and reduced body mass index. CRP can provide valuable insights into the nutritional status of hemodialysis patients and help guide nutritional interventions to improve outcomes [5].

Conclusion

Serum C-reactive protein is a valuable biomarker for assessing inflammation in hemodialysis patients. Elevated CRP levels are associated with increased mortality, cardiovascular disease, infectious complications, and poor nutritional status. Regular monitoring of CRP levels can aid in risk stratification, early detection of complications, and guiding therapeutic interventions. Future research should focus on the role of CRP in personalized medicine and the development of targeted anti-inflammatory therapies to improve outcomes in hemodialysis patients.

References

1. Kolb-Bachofen V. A review on the biological properties of C-reactive protein. *Immunobiol.* 1991;183(1-2):133-45.
2. Yeun JY, Levine RA, Mantadilok V, et al. C-reactive protein predicts all-cause and cardiovascular mortality in hemodialysis patients. *Am J Kidney Dis.* 2000;35(3):469-76.
3. Avram MM, Bonomini LV, Sreedhara R, et al. Predictive value of nutritional markers (albumin, creatinine, cholesterol, and hematocrit) for patients on dialysis for up to 30 years. *Am J Kidney Dis.* 1996;28(6):910-7.
4. Qureshi AR, Alvestrand A, Gutierrez A, et al. Inflammation, malnutrition, and cardiac disease as predictors of mortality in hemodialysis patients. *J Am Soc Nephrol.* 2002;13:28-36.
5. Ridker PM, Hennekens CH, Buring JE, et al. C-reactive protein and other markers of inflammation in the prediction of cardiovascular disease in women. *N Engl J Med.* 2000;342(12):836-43.