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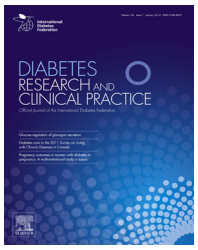

Serum omentin-1 levels as a possible risk factor of mortality in patients with diabetes on haemodialysis

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ABSTRACT

Aim: The main cause of mortality in haemodialysis (HD) patients is cardiovascular disease. Serum omentin-1 level was found to be associated with cardio-metabolic disorders. The aim of this study was to examine the role of omentin-1 as a predictor of mortality in a group of diabetes positive HD patients.

Methods: A total of 120 prevalent HD patients were included in the study from December 2012 to May 2014. Patients were divided into two groups according to the presence or absence of diabetes. Venous blood samples were taken at months 0 and 18 following an overnight fast (prior to a midweek HD session). Serum omentin-1 level was assessed by enzyme-linked immunosorbent assay.

Results: A total of 84 HD patients were analysed at the end of an 18-month follow-up. Omentin-1 levels of HD patients with diabetes were found to be lower than of HD patients without diabetes (9.1 ± 5.8 ng/mL vs. 11.4 ± 4.1 ng/mL, respectively; $P = 0.015$) at the end of follow-up. Omentin-1 levels of survived patients with diabetes were found to be higher than of nonsurvived patients with diabetes (16.5 ± 10.1 ng/mL vs. 12.9 ± 5.3 ng/mL, respectively; $P = 0.045$). During follow-up, 36 patients (30%) died, of whom 25 had diabetes (34%).

Conclusions: Serum omentin-1 levels were significantly lower in HD patients with diabetes. A decrease in omentin-1 levels could be an independent mortality risk factor in this patient group. Further investigation in a greater number of patients is needed.

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1. Introduction

End-stage renal disease (ESRD) is an important public health problem growing worldwide [1,2]. The most common cause of incidence of ESRD is diabetes mellitus [2,3]. Chronic kidney insufficiency is considered an independent risk factor for increased cardiovascular disease (CVD) mortality. ESRD patients, especially those with diabetes mellitus, undergoing chronic haemodialysis have a high incidence of cardiac events; CVD mortality is up to 30 times higher than in general population [4–7]. The main factors that play a central role in the pathogenesis of CVD are inflammation, oxidative stress, malnutrition, vascular calcifications, and endothelial dysfunction [5,7]. There are many molecules that can predict atherosclerotic and inflammatory processes in ESRD [1]. Adipose tissue (AT) is an active endocrine organ that produces several cytokines called adipocytokines. These cytokines play important role in the pathogenesis of diabetes, insulin resistance, metabolic syndrome (MetS) and atherosclerosis [8]. There are two types of adipocytokines: ''good'' and ''bad''. The balance between these two types may affect the vascular system. Recently, a new adipokine called omentin-1 has been identified. Omentin (intelectin-1, intestinal lactoferin receptor, endothelial lectin HL-1, galactofuranose-binding lectin) is a secretory protein produced and secreted by visceral AT which acts as a vasodilator in isolated blood vessels [9–11]. The serum omentin-1 level was found to be associated with cardio metabolic disorders such as insulin resistance, diabetes, dyslipidemia, hypertension, obesity and CVD. Omentin-1 plays an antiinflammatory role in proinflammatory states and it may be a predictive parameter of comorbidities associated with obesity and glucose metabolism [8–11]. Conditions such as obesity and diabetes mellitus are associated with increased cardiovascular morbidity and mortality and lower levels of omentin-1 [8,10–13]. However, adequate treatment like weight loss due to diet or an exercise regime has had positive effects on omentin-1 levels [14,15]. Decreased serum omentin-1 levels are found to be closely associated with MetS in morbidly obese women. Also in these patients serum omentin-1 might be a potential biomarker to predict the development and progression of coronary artery disease [8]. Furthermore, decreased serum omentin-1 levels predict cardiac events in patients with heart failure and also predict the prevalence of coronary artery disease [16,17].

The aim of this study was to examine the role of omentin-1 as predictor of mortality in the group of diabetes positive haemodialysis (HD) patients.

2. Materials and methods

2.1. Subjects

From 1 December 2012 to 31 May 2014, 136 prevalent HD patients on maintenance haemodialysis (4 h treatment, three times a week) at the Department of Nephrology, Dialysis, and Transplantation, Clinical Hospital Centre Rijeka, Croatia, were assessed for eligibility (Fig. 1). Only patients with end-stage renal disease who were on maintenance haemodialysis as a renal replacement therapy were included in the study. Exclusion criteria included patients who had been treated with haemodialysis for less than 6 months, patients with acute renal failure or kidney transplantation, and patients undergoing peritoneal dialysis. There were 120 patients included in the study of whom 84 completed the 18 month follow up and 36 died (Table 1).

The subjects were classified into two groups according to the presence of diabetes: 47 subjects with normal glucose tolerance (diabetes negative group) and 73 subjects diagnosed with type 2 diabetes mellitus (diabetes positive group). The clinical and demographic characteristics of the patients in each group are shown in Table 1. The patients continued taking their regular medications during the study. The subjects in each group were divided into two subgroups based on body mass index (BMI): normal weight (NW; BMI < 25 kg/

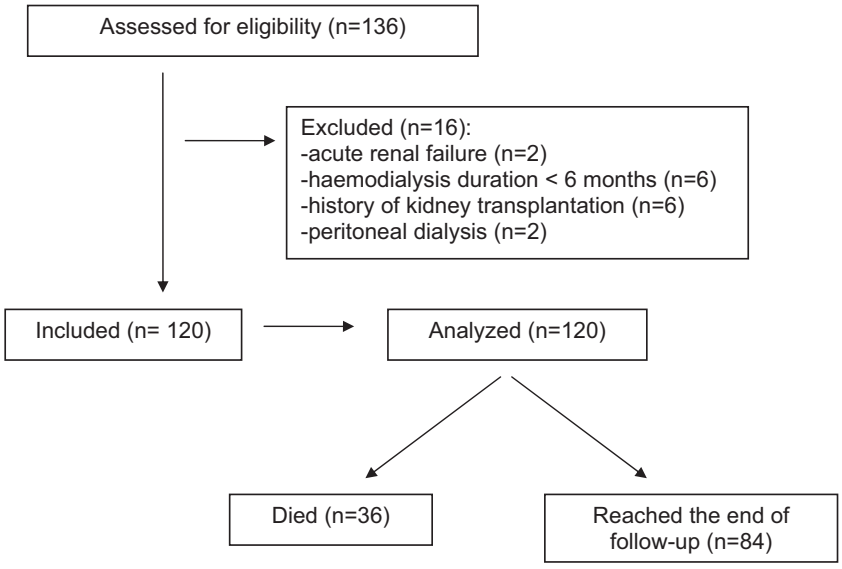

Fig. 1 – Flow of subject through the study.

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