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ADIPONECTIN LEVELS IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND EXCESS BODY WEIGHT: RELATIONSHIP WITH METABOLIC PARAMETERS

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Abstract
The article presents the results of an experimental study aimed at examining adiponectin levels in patients with chronic kidney disease (CKD) and excess body weight, as well as their relationship with metabolic parameters. A negative correlation was found between serum adiponectin concentration and body mass index (BMI), triglyceride levels, and CKD stage. These data highlight the role of adiponectin as a potential marker of metabolic disorders in this patient population.

Introduction

Chronic kidney disease (CKD) is a progressive condition associated with impaired kidney function and systemic metabolic alterations. Patients with excess body weight or obesity experience faster CKD progression due to insulin resistance, dyslipidemia, and chronic inflammation. Adiponectin, an anti-inflammatory adipokine secreted by adipose tissue, plays a key role in regulating energy metabolism, insulin sensitivity, and vascular function. The aim of this study was to evaluate adiponectin levels in CKD patients with excess body weight and to investigate their relationship with metabolic indicators.

Materials and Methods

Study type: Experimental, single-center, cross-sectional design.
Participants: 68 patients with confirmed CKD stages 2–4 were enrolled. Inclusion criteria: age 30–65 years, BMI > 25 kg/m². Exclusion criteria included type 1 diabetes, acute inflammatory diseases, and active malignancies.

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Groups:
- Group I: 36 patients with BMI 25–29.9 (overweight)
- Group II: 32 patients with BMI ≥30 (obese)
Mean age: 54 ± 9 years
Sex: Male — 41 (60%), Female — 27 (40%)
CKD stages (by KDIGO):
- Stage 2 — 18 patients (26%)
- Stage 3 — 34 patients (50%)
- Stage 4 — 16 patients (24%)
Measured parameters:
- Serum adiponectin (ELISA)
- BMI
- Total cholesterol, HDL, LDL, triglycerides
- Fasting glucose
- Creatinine, GFR (by CKD-EPI)
Statistical analysis was performed using SPSS 26.0. T-test, Mann–Whitney U test, and Pearson/Spearman correlation analysis were used.
Results
1. Adiponectin levels:
- Group I — 6.2 ± 1.3 µg/mL
- Group II — 4.1 ± 1.1 µg/mL ($p < 0.01$)
2. Correlation analysis:
- Adiponectin and BMI: $r = –0.58$; $p < 0.001$
- Adiponectin and triglycerides: $r = –0.41$; $p < 0.01$
- Adiponectin and glucose: $r = –0.29$; $p = 0.04$
- Adiponectin and HDL: $r = +0.36$; $p < 0.05$
3. By CKD stages:
- Patients at stage 4 had 22% lower adiponectin levels compared to stage 2 patients with similar BMI
4. Gender differences:
- Women: 6.0 ± 1.5 µg/mL
- Men: 4.8 ± 1.3 µg/mL ($p < 0.05$)

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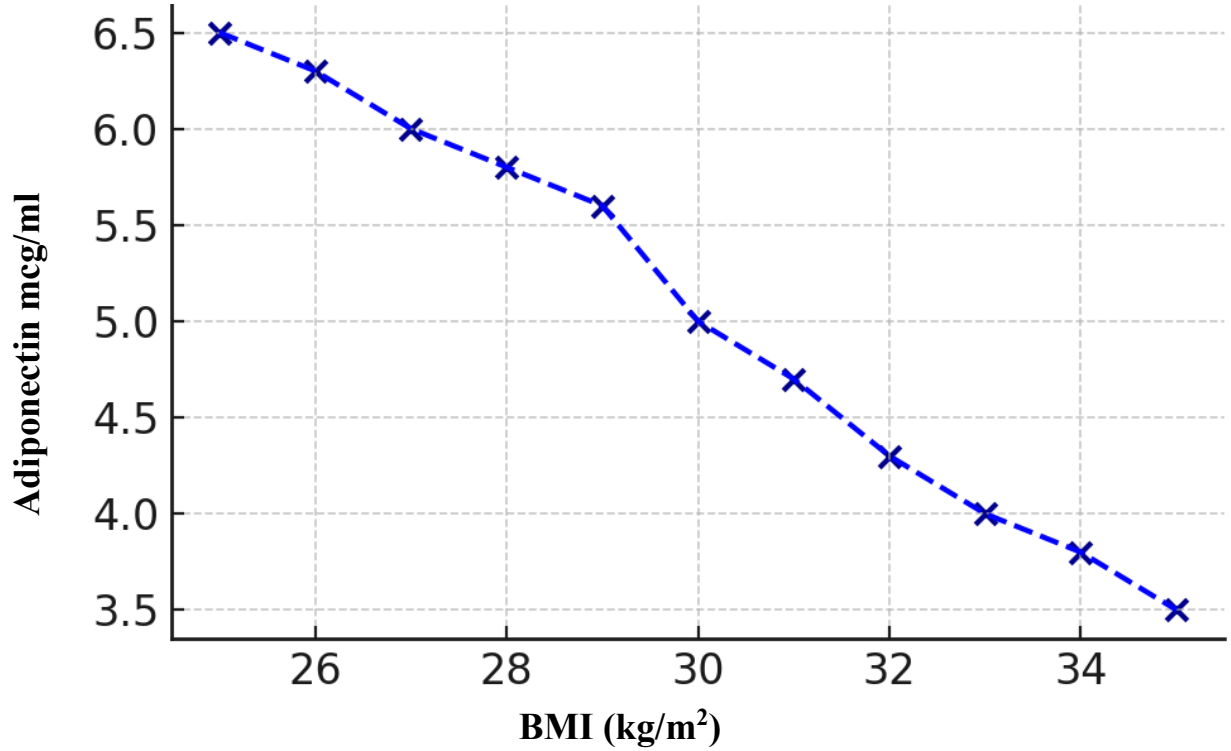
Table 1. Demographic and clinical characteristics of study participants

Indicator	Group I (n=36)	Group II (n=32)	Total(n=68)	p-value
Age (M±SD)	53 ± 8	55 ± 10	54 ± 9	0.37
Men, n (%)	20 (56%)	21 (66%)	41 (60%)	0.41
BMI, kg/m²	27.3 ± 1.5	33.8 ± 2.1	30.2 ± 3.8	<0.001
Adiponectin, mcg/ml	6.2 ± 1.3	4.1 ± 1.1	5.2 ± 1.5	<0.01
Triglycerides, mmol/l	1.6 ± 0.4	2.3 ± 0.5	1.9 ± 0.6	<0.01

Figure 1. Inverse correlation between adiponectin levels and body mass index.



Discussion

The findings confirm previously established data regarding decreased adiponectin levels with increased body weight and metabolic disturbances. In CKD patients, this trend persists and worsens as kidney function declines.

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Reduced adiponectin may contribute to further deterioration of vascular and metabolic status, accelerating CKD progression.

Conclusion

Adiponectin levels in CKD patients are inversely correlated with BMI, triglyceride levels, and CKD stage. These findings suggest that adiponectin may serve as a potential biomarker of metabolic disturbances in overweight CKD patients. Further studies are needed to assess the potential for therapeutic modulation of adiponectin in this population.

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