Patient-Centered Approaches to Medical Intervention

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About MedForum

This book is the collection of selected articles that appeared at the First MedForum: International Conference on Patient-Centered Approaches to Medical Intervention held in Hyderabad in virtual mode on September 27 & 28, 2024.

In this forum following issues were discussed: exploring the collaborative process where healthcare providers and patients work together to select treatments that best align with clinical evidence, patient values, and individual preferences, delving into cutting-edge approaches to tailoring medical interventions based on genetic profiles, lifestyle choices, and environmental factors for improved efficacy and minimized risks, discovering methods to empower patients through education, communication, and the integration of patient-reported outcomes into healthcare practices, examining strategies for reducing disparities and ensuring equitable healthcare access for all, particularly underserved populations, learning about the transformative role of telemedicine, wearable devices, and digital health platforms in modern healthcare, and how they connect patients and professionals with the latest medical advancements, gaining an understanding of the ethical challenges in patient-centered care, including privacy, autonomy, and the ethical use of emerging technologies.


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Early Detection of Renal Dysfunction in Stable Angina and the Impact of Cholesterol Inhibitors

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Abstract

This study evaluated the effectiveness of combined hypolipidemic therapy using rosuvastatin and ezetimibe in 167 patients with stable angina pectoris and renal dysfunction (RD). Patients were divided into two groups based on their glomerular filtration rate (GFR), and the impact of the combined treatment on lipid metabolism and renal function was assessed over a two-year period. Results indicated that the combination therapy led to a significant reduction in low-density lipoprotein (LDL) by 50%, triglycerides by 50%, and improved high-density lipoprotein (HDL) levels by 33.1%. Renal function also showed improvement, with a 75% reduction in proteinuria and a decrease in serum creatinine and cystatin S levels. These findings suggest that the combined treatment effectively reduces cardiovascular risk factors and stabilises kidney function. Future research should explore long-term outcomes, additional biomarkers for early diagnosis, and further interventions to manage comorbidities in patients with both ischemic heart disease and renal dysfunction.

Keywords: Ischemic heart disease, risk factor, stable angina pectoris, dyslipidemia, statins, renal dysfunction, glomerular filtration rate, cystatin S, creatinine.

Introduction

Cardiovascular and renal diseases are closely intertwined, with traditional risk factors (RFs) such as arterial hypertension (AH), obesity, and dyslipidaemia being compounded by kidney-specific factors like hyperhydration and systemic inflammation. These combined factors contribute to the pathogenesis of cardiovascular system (CVS) diseases, leading to increased morbidity and mortality rates due to kidney dysfunction [1,3]. Studies indicate that even minor renal impairments can significantly elevate infection risks and complicate disease outcomes [4]. Renal dysfunction (RD) in ischemic heart disease (IHD) patients exacerbates conditions like dyslipidaemia and endothelial dysfunction, further compromising health outcomes [2]. It is crucial to address the underlying comorbidities in RD patients, with nephroprotective and cardioprotective agents forming the cornerstone of medical interventions [6]. The use of statins, due to their pleiotropic effects, has shown substantial benefits in chronic kidney disease management, including the prevention of glomerulosclerosis and lipid deposition in kidney tissues [5]. The proposed solution, focusing on early diagnosis and combined pharmacological interventions, could greatly enhance treatment outcomes in medical sciences by improving prognosis in patients with overlapping heart and kidney conditions.

Materials and methodology

In this study, 167 patients with stable angina pectoris (average age 61.47±8.42 years) were included, comprising 112 males (67.1%, average age 61.29±8.3 years) and 55 females (32.9%, average age 61.85±8.7 years). The patients were divided into two groups based on their glomerular filtration rate (GFR): 111 patients (66.5%) with GFR ≥ 90 ml/min/1.73 m^2 and 56 patients (33.5%) with GFR ≤ 89 ml/min/1.73 m^2. The study spanned two years (2020-2022) and took place at Tashkent Medical Academy, with a follow-up period of 6 months under both hospital and outpatient settings.

Patients underwent comprehensive diagnostic evaluations, including biochemical analysis, electrocardiography (ECG), Holter monitoring, echocardiography (EchoCG), and Doppler imaging for kidney and liver function assessment. Kidney function was evaluated through serum creatinine, cystatin C, and fetuin A measurements, with proteinuria and fetuinuria indicating renal damage. The calculated GFR revealed renal dysfunction in 33.5% of patients, despite the absence of overt symptoms. Standard cardiovascular therapies, following the European Society of Cardiology guidelines, included angiotensin-converting enzyme inhibitors (ACEIs), β-blockers, statins, and ezetimibe (10 mg) combined with rosuvastatin (20 mg) for cholesterol management.

Inclusion criteria were patients with stable angina and RD, while exclusion criteria likely involved acute kidney disease or severe comorbidities not suitable for study parameters. Additional parameters such as

inflammatory markers or genetic predispositions could further refine the results.

Results

The study aimed to assess the effectiveness of combined hypolipidemic treatment using rosuvastatin and ezetimibe in patients with stable angina pectoris and renal dysfunction (RD). The treatment's impact on lipid metabolism, renal function, and comorbid cardiovascular conditions was evaluated in two patient groups. A total of 167 patients were divided into two groups based on their glomerular filtration rate (GFR). Group 1 had GFR $\geq$ 90 ml/min/1.73 m^2, while Group 2 had GFR $\leq$ 89 ml/min/1.73 m^2. The study results were significant in showing that combined therapy was more effective than monotherapy with rosuvastatin alone.

Lipid Metabolism

The combined treatment led to significant improvements in lipid metabolism. In Group 2 (rosuvastatin + ezetimibe), low-density lipoprotein (LDL) decreased by 50%, compared to 18.6% in Group 1 (rosuvastatin alone) (P<0.001). Very low-density lipoprotein (VLDL) decreased by 23.8% in Group 2, while Group 1 saw a reduction of 16.6%. High-density lipoprotein (HDL) levels increased by 33.1% in Group 2 and 27% in Group 1, indicating a positive shift in lipid profiles (P<0.001). The triglyceride (TG) levels also significantly decreased by 27.7% in Group 1 and 50% in Group 2, illustrating that combination therapy had a greater effect on reducing risk factors associated with dyslipidaemia.

Renal Function

Renal function, as measured by creatinine, cystatin S, and GFR, showed significant improvements in both groups after treatment. In Group 1, creatinine decreased by 12.6%, and in Group 2, by 7.1%. Cystatin S levels also dropped by 12% in Group 2 and 8.3% in Group 1 (P<0.001). The improvement in GFR was notable in both groups: Group 1 increased to 80.2±1.6 ml/min/1.73 m^2, and Group 2 to 79.4±1.4 ml/min/1.73 m^2 (P<0.05). Proteinuria (PU) decreased by 60% in Group 1 and 75% in Group 2, signifying enhanced renal protection through combined therapy.

Table 1: Comparative Analysis of Renal Function and Biochemical Markers

Indicator	Group 1 (Rosuvastatin)	Group 2 (Rosuvastatin + Ezetimibe)	P-Value
Creatinine (mmol/l)	74.5±7.5	71.8±7.7	<0.05
Cystatin S (mg/l)	1.2±0.02	1.25±0.02	<0.001
GFR (ml/min/1.73m^2)	80.2±1.6	79.4±1.4	<0.01
Proteinuria (g/l)	0.002±0.002 (60% reduction)	0.001±0.004 (75% reduction)	<0.001

Table 2: Lipid Profile Changes

Indicator	Group 1 (Rosuvastatin)	Group 2 (Rosuvastatin + Ezetimibe)	P-Value
LDL (%)	-18.6%	-50%	<0.001
HDL (%)	+27%	+33.1%	<0.001
Triglycerides (%)	-27.7%	-50%	<0.001
VLDL (%)	-16.6%	-23.8%	<0.001

Figure 1 shows the reduction in proteinuria, serum creatinine, cystatin S, and the improvement in GFR for both treatment groups (rosuvastatin alone and rosuvastatin + ezetimibe). Group 2 (combination therapy) generally showed better results across all indicators.

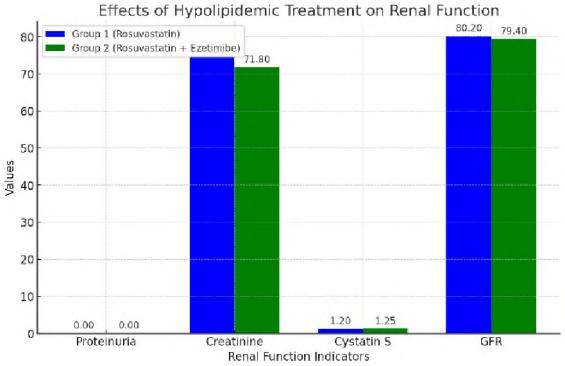

Figure 1. Effects of Hypolipidemic Treatment on Renal Function

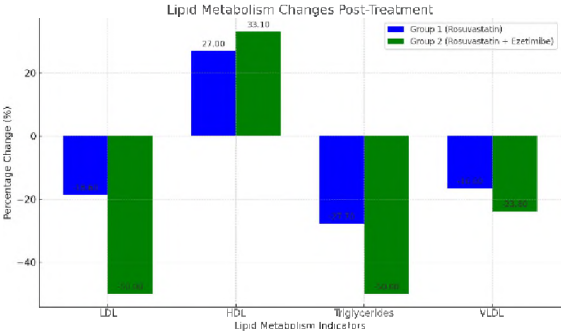

Figure 2. Lipid Metabolism Changes Post-Treatment

Figure 2 highlights the changes in lipid profiles, where the combined treatment resulted in significantly greater improvements in LDL, HDL, triglycerides, and VLDL compared to monotherapy.

Discussion

The study demonstrates that combined hypolipidemic treatment using rosuvastatin and ezetimibe is superior to monotherapy in managing patients with stable angina pectoris and renal dysfunction. The combined therapy not only improved lipid metabolism but also stabilised kidney function by significantly reducing proteinuria, serum creatinine, and cystatin S levels. Patients with RD are at higher risk of cardiovascular events, and addressing both lipid and kidney dysfunction can lower this risk. The addition of ezetimibe enhances the effect of statins, particularly in patients with elevated LDL and VLDL levels, which are often resistant to statin monotherapy.

The results also show a correlation between improved lipid profiles and better renal function, suggesting that combined therapy could provide a dual benefit in reducing cardiovascular and renal complications. Importantly, the findings highlight the need for early intervention, as indicated by fetuin-A measurements and proteinuria, to prevent further decline in kidney function. The reduction in fetuinuria is particularly significant, indicating early-stage RD, which can be managed effectively with appropriate hypolipidemic treatment.

In conclusion, this study confirms the efficacy of combined treatment in reducing cardiovascular risk factors and stabilising kidney function in patients with RD and stable angina pectoris.

Conclusion

The study concludes that combined hypolipidemic treatment using rosuvastatin and ezetimibe is significantly more effective than monotherapy in managing patients with stable angina pectoris and renal dysfunction. The combination therapy led to greater reductions in LDL (50%) and triglycerides (50%), alongside notable improvements in HDL levels (33.1%) and kidney function, including a 75% reduction in proteinuria and decreases in serum creatinine and cystatin S. These results demonstrate that addressing both lipid and renal dysfunction concurrently can effectively reduce cardiovascular risk factors while stabilising kidney function.

Based on these findings, it is recommended that a combined therapeutic approach should be considered for patients with both ischemic heart disease and renal dysfunction to improve clinical outcomes. Future research should focus on long-term effects of this treatment, investigate other potential biomarkers for early diagnosis, and explore additional interventions for managing comorbidities that may impact both cardiovascular and renal health.

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Note: All the figures and tables in this chapter were made by the author.