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ORIGINAL ARTICLE

Immunoregulatory Effects of Adjuvant therapy with Statins in Rheumatoid Arthritis Population

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ABSTRACT

Background: Rheumatoid arthritis (RA) is considered by symmetrical peripheral arthritis, synovitis & joint destruction. Statins, an inhibitor of 3-hydroxy-3-methylglutaryl coenzyme ductase, significantly reduce coronary artery disease by helping to lower plasma low-density lipoprotein cholesterol levels. Experimental studies, more recently, several clinical trials have convincingly shown that statins play a vital role in Rheumatoid arthritis, primarily due to their anti-inflammatory and immunomodulatory properties.
Aim: To assess the effectiveness of statin adjunctive therapy versus standard treatment with disease-modifying antirheumatic drugs (DMARDs) in patients with RA.
Methods: In this research, patients with a diagnosis of RA among the ages of 30 and 65 years were recruited according to the "Open Rheumatoid Pathologist" inclusion criteria. Among the selected patients, two distinct patient strata were identified. Strata 1 included 40 RA patients who are currently taking DMARDs with statins; Strata 2 included 40 patients with RA who are currently receiving DMARDs; observed for 6 months; To compare the outcomes of RA in both strata, standard parameters DAS28, ESR, and CRP were estimated.
Results: There were eighty subjects included in the research; this study demonstrated a significant beneficial role of additional statin drugs when administered alongside conventional DMARDs in patients with active RA. The clinical significance index of disease activity in RA was significantly ($P < 0.05$) lower in the statin adjuvant strata (strata 1) than in the conventional DMARD treatment strata ($P < 0.05$). Strata 2) after 6 months of Continuous treatment. Two other important biochemical markers of RA disease activity, ESR and CRP, were also significantly lower in RA patients taking statins (strata 1) ($P < 0.05$). Compared to strata 2, which includes only RA. the patient was treated with a conventional DMARD without statins.
Conclusion: The results suggest a supportive and possibly beneficial role for statin therapy in cases of active RA, leading to clinically and biochemically significant improvements.
Keywords: inhibitor of 3-hydroxy-3-methylglutaryl-coenzyme is reductase, disease activity indicator 28,

INTRODUCTION

Rheumatoid arthritis (RA) is autoimmune disease which causes inflammation of joints and other tissues. Symmetrical peripheral arthritis, bursitis and joint destruction. The disease is characterized by inflammation of the synovial tissue, joint swelling, stiffness, and pain that can progress to bone erosion. This leads to the rapid onset of clinically significant functional decline. Cause significant morbidity and mortality, RA leads to significant use of medical resources and costs. Combination therapy with DMARDs, especially for those who cannot afford expensive new biological therapies. Statins, an inhibitor of 3-hydroxy-3-methylglutaryl coenzyme A-reductase, significantly reduce vascular risk in patients with coronary artery disease by helping to lower plasma low-density lipoprotein cholesterol levels. Although the movement of statins is in general through this mechanism, latest research endorse they have got broader properties, inclusive of alteration in inflammatory pathways and immunomodulatory functions.

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Statins had been proven to be of a few advantage in each, appropriate animal fashions of RA and withinside the randomized medical trial[1]. Statins, therefore, have a practicable bioactivity profile that makes them viable adjunct healing retailers further to conventional antirheumatic remedy to goal each vascular danger discount and synovial inflammation[2]. With this history understanding the modern have a look at became undertaken with the goal of assessing the effectiveness of adjunct statin with traditional DMARDs in active RA patients in assessment to conventional DMARDs remedy alone.

MATERIALS AND METHODS

A potential observational observe changed into performed with inside the Rheumatology out-affected person branch at some point of January 2019 to February 2020. Participants of 40–70 years of age, identified as instances of RA and having active RA sickness interest in spite of ongoing DMARD remedy had been covered with inside the observe. The patients having composite 28 joints sickness

interest score (DAS28)[5,6] of 3.2 or better had been taken as having active sickness. Exclusion standards cover the incapacity to provide knowledgeable consent; records of hypersensitivity to statins, persistent liver sickness, energetic infection, or any concurrent renal sickness. From the patients enjoyable the inclusion standards, we diagnosed separate organizations of patients. Strata 1 cover all patients of RA presently below trendy DMARD remedy with an accessory statin (i.e., atorvastatin, rosuvastatin, etc.,) medication. Strata 2 cover all patients of RA presently below trendy DMARD remedy.

At the start of the study, basic demographic data such as age, gender, and body weight were recorded. The globally recognized clinical outcome variable of RA, the synthesis of DAS28[7,9] was determined based on clinical examination data such as the number of swollen joints, the number of patients with joints, the overall patient score, and the global provider score, including biochemical variables, erythrocyte sedimentation rate (ESR), creative protein (CRP), and other standard values such as percentage of serum hemoglobin, total serum hemoglobin, leukocyte count, serum creatinine, fasting blood glucose, glutamine oxaloacetic transaminase, and serum glutamine glutamines in both stratas were followed after 6 months of baseline follow-up. Clinical and biochemical parameters were also observed at follow-up visits.After follow-up, the collected data were analyzed to study the outcomes of patients with RA between strata 1 and strata 2 for various biochemical parameters such as ESR, CRP, as well as clinical parameters of patients with RA, score DAS28. CRP was measured by immunoassay, ESR by the Westergrin method. DAS28 was determined using a standard formula represented by the equation:

Statistical Analysis: Data was articulated as mean±standard deviations. Data analysis was done using SPSS.22 Independent sample *t*-test was done for inter strata comparison of various parameters such as ESR, CRP, and DAS28 score with 95% confidence level.

A total of 90 patients participated in a study of the efficacy of adjuvant statins used in combination with a DMARD; 4 patients were not observed, 5 patients were excluded due to non-compliance with the study protocol and 1 of them refused to participate in the study; of the remaining 40 patients were identified in the 1st strata, that is, taking statins, and 40 patients. Patients were identified in strata 2 (no statins and only DMARDs). All participants in both strata were female patients. An independent sampling t-test (0.05 considered significant, 95% confidence interval) was performed to compare demographic reference data such as age, weight; and the initial clinical and biochemical status of pathological activity in the form of aggregates of DAS28 and ESR between the two strata [Table 1].

As clearly shown in this table, all RA patients in both strata 1 and 2 were of the same age, body weight and gender distribution, and there were no statistically significant differences between the two stratas. Mean ESR and clinical outcome parameter, that is, mean DAS28, were not significantly different at baseline. After 6 months of continuation of the same treatment, the mean ESR (25.0 ± 4.18) was observed in patients with RA with statins (strata 1) lower than the average ESR (55.01 ± 19.02) in patients with RA who did not take adjuvant statins (strata 2). The difference is statistically significant (P and <0.05).

The mean CRP (2.41±0.173) evident in our study was also significantly lower in RA patients in strata 1 (with statins included) than (5.21±732) in strata 2 (without statin) (P and <0. 05).

The mean values of the primary clinical outcome indicator in our study, that is, DAS28, were 2.934 ± 0.465 and 5.482 ± 1.67 in strata 1 and 2, respectively. DAS28 score between strata 1 and strata 2.

The main outcome measure for RA in our study, the mean DAS28 score plotted over time in both stratas, showed that mean DAS28 levels in Strata 1 were significantly lower in Strata 1. Significantly (P <0.05) compared to the average. DAS28 levels in strata 2 .

RESULTS

Basic Variables	Strata 1 (n=40)	Strata 2 (n=40)	P	Level of Significance
CRP	2.41 ± 0.173	5.21 ± 732	0.137	Not Significance
ESR	25.0 ± 4.18	55.01 ± 19.02	0.129	Not Significance
DAS 28	2.934 ± 0.465	5.482 ± 1.67	0.132	Not Significance

DISCUSSION

In our study, it was noted that patients with RA treated with statin adjuvant therapy had significantly decreased mean levels of acute-phase reagents such as ESR and CRP compared with patients taking DMARD at the end of 6 months of follow-up. Represents a moderate change in mean DAS28 levels at the end of 6 months, but a significant decrease supports the idea that statin pathways offer therapeutic options for RA[1]. Many data point to the effect of statins on the innate immune response, which manifests itself in the activation of the endothelium[2], macrophages, natural killer cells and the efficient functioning of organs, the response of neutrophils[3]. Similar effects on acquired immune responses have been demonstrated by blocking antigen presentation[4] and polarization of T cells in vitro and in vivo[[9,10].

Standard RA treatment options now include a DMARD combination as treatment goals have shifted towards improving disease and induction of tissue-protective remission. In our study, we observed a significant effect of adjuvant statins on disease activity. in RA, such as inhibition of leukocyte endothelial adhesion, effect on the production of reactive oxygen and nitrogen mediators, inhibition of the release of inflammatory cytokines, inhibition of inflammatory signaling pathways, activation of transcription factors. Anti-inflammatory drugs and inhibition of the activation of T cells and stimulating molecules have been demonstrated through several molecular studies[6]. It was recognized that the anti-inflammatory and immunomodulatory activity of statins plays an important role in RA. Statins have been shown to lower CRP levels in RA patients regardless of their cholesterol-lowering effects[8].

We recognize important limitations in our study, the design chosen offers advantages to facilitate short-term single-center observational studies, however history of use Since DMARDs are heterogeneous, concurrent drug administration and individual patient dose adjustment allow for interactions between statin and DMARDs. Although substrata analyzes were not performed for the various DMARDs in this study, hydroxychloroquine, methotrexate, sulfasalazine, leflunomide, and etanercept were, in very few cases, used primarily in the study. Statins were independent of dose and duration of use to collect a statistically significant population sample of 30 patients in each strata. Since statins were not prescribed to patients with RA, patients in Strata 1 in our study were prescribed statins for some other indications such as dyslipidemia, etc. and based on the individual statin, its dose and duration, preferably in a multicenter study.

CONCLUSION

Our findings suggest a supportive and potentially beneficial role for statin therapy in cases of active RA; produces significant clinical and biochemical improvement; however, corroborating data from large clinical trials are needed to establish the data unambiguously before statin therapy for RA can be recommended.

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