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RESEARCH ARTICLE

DOES TREATMENT OF PSORIASIS WITH BIOLOGICS AFFECT THE CARDIAC OUTCOME?. A STUDY IN A GROUP OF JORDANIAN PATIENTS

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ABSTRACT

Introduction: Psoriasis is one of the major diseases for which patients visit dermatology clinics. Not only it affects the skin, but also its multi-systemic nature is being more recognized. Apart from the well-known psoriatic arthritis, psoriasis has been shown to increase the likelihood of ischemic heart disease, partly due to the stress and lifestyles patients may adopt, and also more importantly and as recently presumed due to the inflammatory nature of the disease. In studies on patients treated with systemic immunomodulators including TNF alpha inhibitors, interleukin-12/23 inhibitors, and interleukin-17 inhibitors, ischemic heart disease showed improvement. **Objective:** To determine whether or not ischemic heart disease improves with treatment of psoriasis with biological therapy at King Hussein Medical Centre, Jordanian Royal Medical Services. **Methods:** We aim to assess psoriatic patients who are planned or currently receiving biological treatments for psoriasis at King Hussein Medical Centre for the presence of ischemic heart disease at the cardiology clinics at Queen Alia Heart Institute. We plan to reassess them after clinical psoriasis improvement. **Results:** All the patients improved more than 50%(according to PASI score) regarding their psoriasis when reevaluated 14 months after starting biologics. About 54% of patients who were found to have non-calcific coronary plaques, showed reduction by 5%-15% in coronary plaque burden after 14 months from starting biologics. **Conclusion:** Treatment of moderate to severe psoriasis with biological agents has a positive effect in reducing and altering the coronary non-calcific plaque burden.

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INTRODUCTION

Psoriasis as a chronic inflammatory disease is considered as a risk factor for cardiovascular disease due to the inflammatory nature of the disease, and recent studies on patients treated with systemic immune-modulators (TNF alpha inhibitors, anti-interleukin, 17) is associated with decrease the risk of cardiovascular disease (Rendon, 2019; Ludwig, 2007) and that by decreasing the coronary inflammation and plaque burden. Psoriasis is one of the commonest diseases that present to dermatology clinics. Despite it being considered as a dermatological entity, more recently, the systemic nature of the disease has been clearly elaborated. This includes inflammation of the skin, often the joints, eyes, with aspects of the disease affecting the CVS, lipids, and the psychological status of the affected patient. Cardiovascular disease in psoriasis can be attributed to inflammation, as recently shown in many studies. It also can be related to the habits that can

In our study, we aimed to look at the cardiovascular parameters of patients presenting to dermatology clinics with moderate to severe psoriasis, who were treated with biological therapies, before and after treatment, in order to assess the effects of the treatment on both the skin and the cardiovascular system.

METHODS

We assessed the patients with psoriasis who were eligible for biologic therapy before and after treatment. A total of 78 patients, who visited dermatology department with moderate to severe psoriasis between February 2021 and April 2022, were enrolled in our study. Assessment of the cardiovascular system was done using coronary computed tomography angiography (CCTA) to quantify the non-calcific plaques in the three coronary arteries (right coronary artery, left anterior descending artery, and left circumflex artery). Assessment was

14 months afterwards. Psoriasis area and severity index (PASI) scores were also obtained at week 0 & 60 week. The mean age of the patients was about 45 years, with moderate to severe psoriasis according to PASI score, and with low risk for coronary artery disease. All patients started treatment with biologics (TNF alpha inhibitors, interleukin-12/23 inhibitors, and interleukin-17 inhibitors) within one month from evaluation at dermatology clinic, and underwent coronary computed tomography angiography (CCTA). After 14 months of initiation of biological treatment, all psoriatic patients were re-assessed at the dermatology clinic, and by repeating CCTA for each one of them.

RESULTS

Of 78 patients, 39 patients found to have coronary non-calcific atherosclerotic plaque before initiation biological treatment. After 14 months of biological treatment all patients reassessed dermatologically using PASI score, and coronary CTA was repeated for all of them. All patients showed significant improvement in their dermatological condition of more than 50% ($p < 0.001$) (by PASI score), and about 21 patients (54%) of the 39 patients who were found to have coronary non-calcific atherosclerotic plaque, showed improvement (about 5%-15% reduction) in their coronaries non-calcific plaque burden.

DISCUSSION

Psoriasis is a common disease that affects almost 2% of the population and is one of the commonest reasons for referral to dermatology clinics. It typically affects the skin with erythematous scaly plaques. The inflammatory nature of psoriasis has been more clearly elucidated in the past two decades (Rendon, 2019). The skin is not the only organ affected by psoriasis. The multi-systemic nature of psoriasis has been emphasized, with involvement of many systems such as the joints, eyes, and the cardiovascular system. Psoriatic patients also have been found to have more risk of diabetes, hyperlipidemia, hypertension, and increased body mass index i.e, the metabolic syndrome. Coronary plaques were found to be twice as common in psoriatic patients (Ludwig, 2007). Moreover, Psoriasis has been found to be an independent risk factor for the development of myocardial infarction, stroke, and cardiovascular-disease related death (Armstrong, 2013). The risk is present in mild psoriatic disease to a less extent (Armstrong, 2013). Treatment of psoriasis includes the use of topical treatments as well as systemic treatments with immunomodulators for patients with moderate to severe disease. Psoriasis Area and Severity Index (PASI) score is used as an objective means to assess psoriatic skin disease improvement on systemic therapies. Following the better understanding of the inflammatory processes involved in psoriasis, targeted systemic therapies (i.e. biological agents) are being used more widely, with higher change in PASI achieved after treatment, indicating better response of skin disease. Similar to skin disease, inflammation has recently been implicated as anetiopathogenetic mechanism behind atherosclerotic disease (Libby, 2002). It starts with leukocytes accumulations in the sub endothelial space, then by other inflammatory cells causing pathologies starting with the fatty streak, and progressing to atherosclerosis. The inflammatory process includes release of pro-inflammatory cytokines, such as IL-1,

6, and TNF-a. They can lead to production of fibroblast growth factor (FGF) platelet-derived growth factor (PDGF) (Christiano Fava, 2018). Several studies have looked at the effect of anti-inflammatory treatments in the vascular inflammation. Methotrexate has been found in observational studies to be associated with a decreased risk for cardiovascular disease (Christiano Fava, 2018). Regarding biological agents, more recent research has provided proof, with studies showing that treatment of psoriasis with biological agents (anti-TNF-a, anti-IL-12/23, and anti-IL-17) was associated with an improved non-calcified coronary plaque burden (Elnabawi, 2019). Lipid Rich Necrotic Core is a high risk coronary plaque that is found in patients with chronic inflammation, and is associated with the severity of psoriasis and comorbidities. It has been found to be reduced by treatment of psoriasis with biological agents (Harry Choi, 2020). In our study, it is shown that treatment of psoriatic patients with biologics was associated with a significant change in PASI, as well as reducing and alteration the morphology of the coronary non-calcific plaques by CCTA.

Conclusion

In conclusion, our study demonstrates that biological agents used in the treatment of moderate to severe psoriasis have a positive role in reducing the risk of cardiovascular disease by reducing the burden of coronary non-calcific plaques as well as by modification plaque morphology.

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