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ASSOCATION BETWEEN PSORIASIS AND CELIAC DISEASE :A SYSTEMATIC REVIEW

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ABSTRACT

Psoriasis is an inflammatory illness that affects the skin and is characterised by the formation of erythematous and scaly plaques. Psoriasis is a chronic condition. Psoriasis vulgaris, often known as plaque psoriasis, is the most common form of psoriasis; however, there are many other types of psoriasis as well. Psoriasis vulgaris is the most common form of psoriasis. The bulk of the research that was done to study whether or not celiac disease and psoriasis could have a connection was flawed or biased in some way, which resulted in conclusions that could not be considered definitive. These flaws or biases included a small sample size, a lack of controls, a low accuracy of serological methods used to screen for celiac disease (i.e. anti-gliadin antibodies, AGAs), and the setting, including the design as single-centre studies. All of these issues contributed to the conclusion that the study was flawed or biased. Despite the fact that there is a connection between the two disorders, the physiopathologic mechanisms that are at the root of the connection between psoriasis and CD have not been fully explored. The presence of shared genes (at-risk HLA haplotypes), which are frequently taken into consideration when attempting to explain the increased incidence of CD in a number of autoimmune illnesses, could be present in people who have psoriasis, according to our working hypothesis. Psoriasis is a chronic inflammatory skin condition that can affect any part of the body. Although the results of the link between psoriasis and celiac disease based on the research that was conducted in 2010 are inconsistent, newer studies and studies that were conducted before 2010 provide evidence that there is a connection between the two conditions. Celiac disease is an autoimmune disorder that affects the small intestine and can cause psoriasis.

Keyword: *Autoimmune; Celiac disease; Gluten; Psoriasis.*

INTRODUCTION

Psoriasis has been estimated to have a prevalence of between 2% and 4% in the adult population, making it one of the most prevalent immune-mediated skin disorders. The pathological hallmark of the disease is an increase in the number of keratinocytes that have the ability to proliferate.[1,2] Psoriasis is known to be associated with an increased risk of a number of comorbidities, some of which include inflammatory arthritis, metabolic syndrome, and atherosclerotic disease. It is not known what causes this autoimmune disorder; however, it is thought to be the result of a complex interaction between a genetic predisposition and environmental factors such as smoking, having a high body mass index, and drinking an excessive amount of alcohol.[3–5]

Since 1971, when Marks and Shuster[6] reported a small group of patients with severe psoriasis who presented with diarrhea/steatorrhea and were ultimately found to have enteropathy that was characterized by histological changes similar to celiac disease, the association between psoriasis and enteropathy has been recognized. Enteropathy of the small intestine is what people with celiac disease have. Gluten in the diet of individuals who are predisposed to the condition is what sets it off. The genetic makeup of an individual determines their level of vulnerability. The ailment is chronic, and at the moment, the sole therapy consists of completely cutting out gluten from the patient's diet for the rest of their lives.[7]

In order to have this condition, an individual has to have HLA dominant DQ2 or DQ8 genes. An unpleasant reaction of the immune system to gluten is the cause of the disease, and an antibody to tissue transglutaminase is one of the major proteins involved. Nevertheless, there are a number of additional hypothesized mechanisms that contribute to the condition. Through an increase in the synthesis of interleukin 15 (IL-15), the glycoprotein gliadin, which is found in gluten, has a direct harmful impact on enterocytes. Marks and Shuster found that the patients with severe psoriasis who had enteropathy had diarrhea/steatorrhea (CD).[7] However, subsequent epidemiologic studies that attempted to characterize this association have yielded inconclusive results, primarily because of the small sample size that was used in the studies.[8–10]This article explores the link between psoriasis and celiac disease and provides some supporting evidence.

METHODS

The full-text papers written in English were used as the source material for the data that was gathered for the purpose of conducting this systematic review. The review's purpose was to determine association between psoriasis and celiac disease (CeD). During the process of producing this essay, the databases Pubmed and Google Schoolar were utilized extensively throughout the research phase. The following was mentioned among the conditions for eligibility: (1) A cohort study, cross-sectional study, or case–control study that reported the risk of CD among patients with psoriasis compared with participants who did not have psoriasis; (2) A relative risk, hazard ratio, incidence ratio (IR), or standardized IR with 95% confidence intervals (CIs), or sufficient data to calculate those ratios were provided.

Table 1. The litelature include in this study

Author	Origin	Method	Sample Size	Period	Result
Bastiani, 2015[11]	Italy	Multicenter study	218 patients with psoriasis and 264 controls	No data	Nine (4.1%) psoriatic patients had positive anti-tissue transglutaminase antibodies compared to only 1 among controls (0.4%, p <0.05; OR 2.03, 95% CI 1.42-90.11).
Montesu, 2011[10]	Italy	Cohort prospective	100 patients with psoriasis and 100 controls	October and December 2008	Link between celiac disease and psoriasis did not hold up under statistical (p-value = 0.49). Although the group with psoriasis presented slightly higher values than the controls, the remaining subjects in both the psoriasis group and the control group had values that were lower than the threshold value.

The keywords used in the search were “psoriasis” and “celiac disease”. We include study conducted above in 2010-2022. This analysis followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) paradigm,

in which the researchers originally entered keywords into each database. The phrases : ("coeliac disease"[All Fields] OR "celiac disease"[MeSH Terms] OR ("celiac"[All Fields] AND "disease"[All Fields]) OR "celiac disease"[All Fields]) AND ("psoriasis"[MeSH Terms] OR "psoriasis"[All Fields] OR "psoriases"[All Fields] OR "psoriasi"[All Fields]) used in this study. We received two articles, which will be discussed during the discussion **(Table 1)**.

RESULT

Psoriatic patients were more likely to have positive anti-tissue transglutaminase antibodies than control patients were, with nine patients (4.1%) having positive antibodies compared to only one control patient (0.4%, $p < 0.05$; odds ratio (OR) = 2.03, 95% confidence interval (CI) = 1.42-90.11). Histological examination of all 10 patients yielded results that were consistent with a diagnosis of CD. At the end of the GFD treatment period of six months, skin lesions had significantly improved in seven out of eight patients who had psoriasis.[11]

Testing for anti-transglutaminase antibody in both groups found two psoriasis patients with levels greater than 7.1 U/ml, which indicates that they are over the threshold level. Additional testing on these individuals, including a biopsy of their intestinal tissue, provided support for the diagnosis of coeliac disease. However, the link between celiac disease and psoriasis did not hold up under statistical scrutiny (p-value = 0.49). Although the group with psoriasis presented slightly higher values than the controls, the remaining subjects in both the psoriasis group and the control group had values that were lower than the threshold value. In particular, three patients' values fell within the range of 1.1–2 U/ml, and four patients' values fell within the range of 2.1–3 U/ml. When analyzing the link between first-degree familiality for celiac disease and psoriasis (p-value = 0.059), it was found that there was a marginal significance, which is a finding that is very important to note.[10]

DISCUSSION

Psoriasis is a chronic inflammatory disease that affects the skin and is defined by the development of erythematous and scaly plaques. Psoriasis vulgaris, which is often referred to as plaque psoriasis, is the most prevalent form of psoriasis; however, there are various other forms of psoriasis as well.[12] A systematic review was carried out in 2018 by the Medical Board of the National Psoriasis Foundation with the intention of establishing dietary advice for individuals who suffer from psoriasis or psoriatic arthritis.[12]

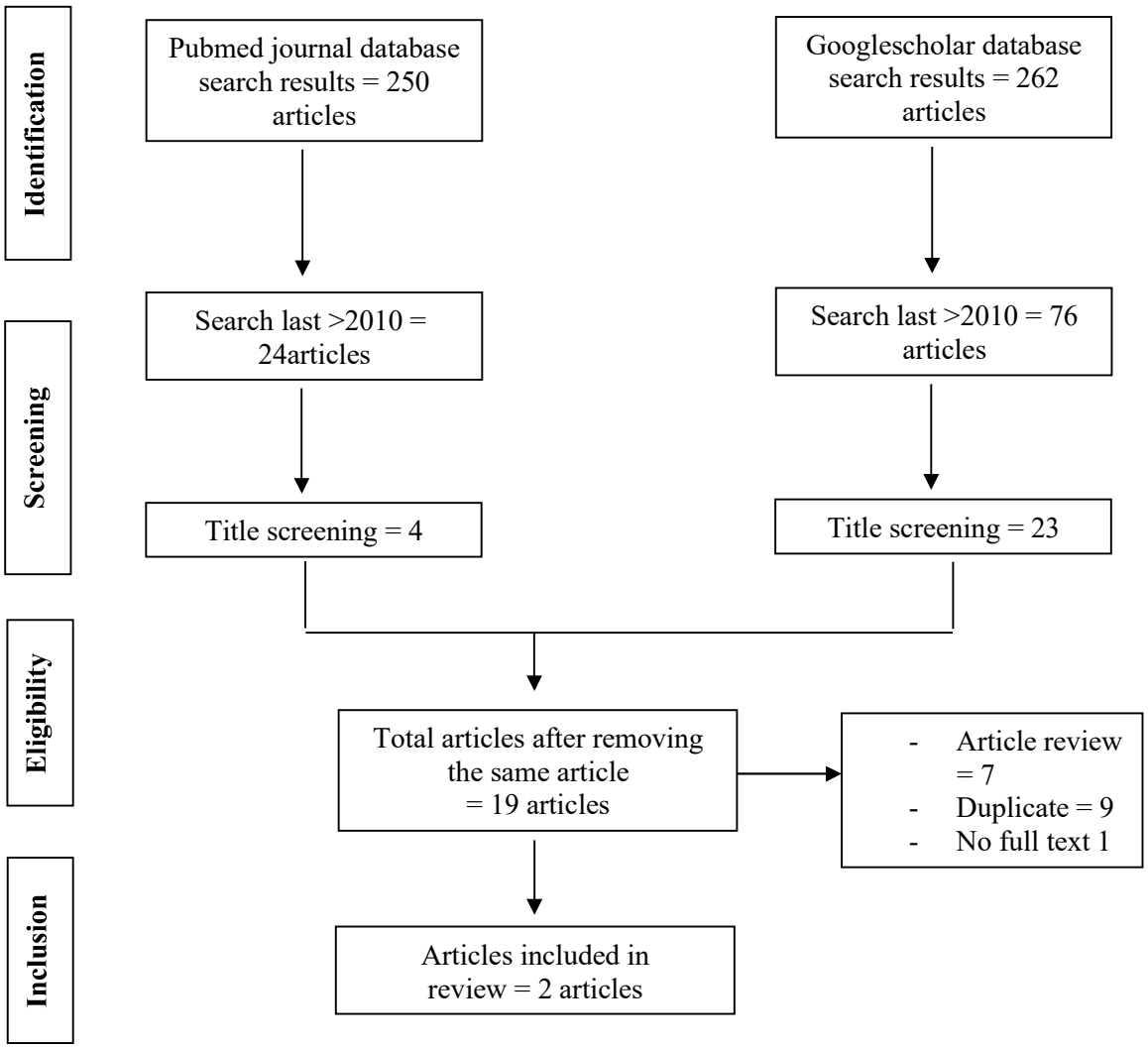

Figure 1. Article search flowchart

They cautiously propose a gluten-free diet only in individuals who test positive for serologic indicators of gluten sensitivity. The prevalence of the gluten-free diet (GFD) among patients suffering from psoriasis is highlighted in a study that was conducted in the United States in 2017. In this study, 38% of the patients who responded (n = 1206) reported that they avoided gluten, and 53.4% of those patients (247/459) reported that the GFD was responsible for an improvement or clearance of their disease.[13]

The majority of the studies that were conducted to investigate the potential link between celiac disease and psoriasis had several flaws or biases that led to inconclusive findings. These flaws or biases included a small sample size, a lack of controls, a low accuracy of serological methods used to screen for celiac disease (i.e. anti-gliadin antibodies, AGAs), and the setting, including the design as single-centre studies.[9,14,15]

Prevalence of serologic markers of CD in psoriasis and the clinical trials evaluating the impact of GFD on psoriatic lesions, it was found that the majority of the results suggest an association between psoriasis and gluten sensitivity (marked by anti-gliadin IgA positivity), but not necessarily gluten enteropathy.[16] This review Gluten sensitivity was differentiated from celiac disease and characterized as a response to gluten in which allergy and autoimmune causes were ruled out. There is a possibility that AGAs are present, but testing for anti-endomysial/tTG antibodies is negative, and the intestinal mucosa appears to be morphologically normal. Gluten sensitivity is a distinct condition that should not be confused with CD. Because they lack the requisite HLA profile, the vast majority of these patients do not have CD in any of its variants.[17,18]

Because gluten proteins have such a significant influence on the baking quality of wheat flours, the food industry has been interested in them for a very long time. Gluten is the proteinous mass that is left behind after wheat dough has been washed with water. It is composed mostly of the prolamin and glutelin fractions of the wheat storage proteins. Gluten has been described as the proteinous mass that remains when wheat dough is washed with water.[19]

The categorization of grain proteins into four fractions (Osborne fractions) according to their solubility qualities is where the words prolamin and glutelin originated. While prolamins are insoluble in water, glutelins are insoluble in both water and alcohol. Prolamins are soluble in alcohol but insoluble in water. Gliadin and glutenin are the terminology that are used to describe the prolamin and glutelin fractions of wheat, whereas secalin, hordein, and avenin are the terms that are used to represent the prolamin fraction of rye, barley, and oats, respectively.[20,21]

Similar to how the glutelin fractions of rye and barley are typically referred to as secalinin and hordenin, the language used to describe oat glutelins is different. According to the Codex Alimentarius, gluten is "a protein fraction from wheat, rye, barley, oats or their crossbred varieties and derivatives thereof, to which some persons are intolerant and that is insoluble in water and 0.5M NaCl". This definition describes gluten as "a protein fraction from wheat, rye, barley, oats or their crossbred varieties and derivatives thereof." As a direct consequence of this, gluten is now generally accepted to be a generic word that refers to the prolamin and glutelin fractions of wheat, rye, barley, and even oats in some circumstances.[14]

The physiopathologic processes that underlie the link between psoriasis and CD have yet to be fully elucidated despite the relationship between the two conditions. We have a working hypothesis that the presence of shared genes (at-risk HLA haplotypes), which are frequently taken into consideration when attempting to explain the increased incidence of CD in a number of autoimmune illnesses, could be present in people who have psoriasis.[22]

Psoriasis may be affected by CD-related malabsorption in a second way, which is that it may lead to a condition of vitamin D insufficiency. It is common knowledge that those who have low levels of vitamin D are more likely to develop psoriasis. It is also common knowledge that psoriatic lesions can be improved by sun exposure and the topical use of vitamin D analogues. Vitamin D has immunoregulatory characteristics, which may be responsible for this phenomenon.[22]

The following is a summary of the findings from a systematic review and meta-analysis that was conducted in 2019 and comprised 18 papers.[23] Only one of the two studies that looked at the incidence of CD in patients with psoriasis reported a statistically significant increased risk (hazard ratio (HR) = 1.9, 95% confidence interval (CI) = (1.6–2.2) and HR = 1.20, 95% confidence interval (CI) = (0.91–1.59)).[8,24] In a similar manner, two investigations calculated the incidence of

psoriasis among patients with CD; however, in this instance, both studies discovered substantial findings (hazard ratio [HR] = 1.72, 95% confidence interval [CI] = 1.54–1.92) and HR = 1.9, 95% CI = (1.5–2.3)).[24,25]

CONCLUSION

Although there is inconsistency in the results of the link between psoriasis and celiac disease based on the research that were conducted in 2010, newer studies and studies that were conducted before 2010 provide evidence that there is a connection between the two conditions.

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