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Celiac disease in the COVID-19 pandemic

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ABSTRACT

Background: The COVID-19 pandemic has had an impact on global health.
Design: The impact of the COVID-19 pandemic on patients with coeliac disease was assessed in the present review.
Results: The incidence of coeliac disease and the problems associated with coeliac disease increased during the COVID-19 pandemic. Adherence to the diet is crucial for the patient's health and quality of life since the only approved therapy for coeliac disease is a gluten withdrawal.
Conclusions: A gluten-free diet should be promoted by the therapeutic team and implemented among these categories of patients.

1. Introduction

Numerous difficulties were before the COVID-19 pandemic in adhering to gluten withdrawal to coeliac disease (CD) patients [1]. But what happened during the COVID-19 pandemic? CD and dermatitis herpetiformis (DH) are parts of gluten-related disorders (GRDs). Both diseases have a range of intestinal and extraintestinal clinical manifestations [2]. The GRDs incidence was at 5% of the population [3].

The CD incidence has increased in recent years [4–6], probably because of improving diagnostics. The rise in incidence was also due to a real increase of this immune-based disorder, independent of disease detection [5–8]. Screening the period 2020–2021, in Israel, the CD autoimmunity incidence was highest in the pediatric age groups, especially in children aged 0–5, and was 4 times higher than the adults aged 26–55 [9]. In the Asia-Pacific region, the CD prevalence in the general population was higher in children compared with adults and was greater in women vs. men ($P < 0.05$) [10]. Arab's countries such as Saudi Arabia reported the highest CD prevalence among the general population (3.2%) and Tunisia reported the lowest CD prevalence (0.1%). Women demonstrated a higher prevalence of CD compared to men. The peak age at diagnosis fell between 1-3 years and 9–10 years [11]. In Xinjiang Uyghur Autonomous Region, China, CD autoimmunity was found among rural-living subjects with higher wheat consumption compared to urban-living subjects (3.16% vs 0.97%, $P < 0.01$) [12]. In Canada, the CD incidence was highest in women and children [13]. A UK study found a 6% CD seropositivity incidence and 5% CD prevalence. These results were about 5-fold higher than the UK population estimates [14]. In Denmark, the undiagnosed CD prevalence was 1.0%, with no statistically significant increase over time [15]. A USA study associated higher latitude with greater serology-based CD prevalence [16]. In a Swedish population, between the years 2010 and 2017 there were 49 829 CD patients with a small but statistically significant increased mortality risk [17].

A Finland study found that the DH incidence decreased [18]. But in another USA and Sweden study, the researchers found that patients with CD are at increased risk of multiple common skin disorders, a risk that persists in the long-term compared to the general population, [19]. Another Finland study associated atopic dermatitis with DH and CD in children [20]. The conclusion was given by another Finland study: in DH, a life-long gluten-free diet (GFD) resolves the rash and enteropathy, increases the quality of life (QOL), and offers a positive long-term prognosis [21].

Multiple scientific publications appeared on CD during the SARS-CoV-2 2020–2021 pandemic, however, the impact of the virus on CD incidence is not clear. Presently, we analyzed the literature to find the causes for the contemporary increased incidence of CD. We screened the PubMed database, applying the keywords "celiac disease incidence", spanning only the data from the recent 2020–2021 years.

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2. Suggested causes for the recent increase in CD incidence

2.1. Inadequate knowledge about CD

In Central Europe, the knowledge about CD among healthcare professionals and CD patients was not satisfactory [22]. In Italy, the lower age was the only clinical variable that affected the QOL of CD children and their parents [23]. A study from Argentina reported a higher score of health-related QOL among those people who admit having knowledge of CD related national regulations and benefits [24]. The health-related QOL for Saudi CD children on GFD was generally comparable to the healthy control, except for the general health domain [25]. A CD children study from Spanish revealed the main concerns of the respondents to the social and economic difficulties of GFD [26]. In Sweden, there was no clear relationship between CD and socioeconomic place [27]. In Brazil, the program's implementation to increase awareness about GRDs among healthcare professionals and giving scientifically sound information to the general population about the risks and benefits of following a GFD were desirable actions [28].

2.2. Increase in associated chronic diseases

CD is associated with many autoimmune, inflammatory, and behavioral conditions and is a frequent condition in polyautoimmunity syndrome [1,29,30].

2.2.1. B1. Behavioral and psychiatric disorders

A Sweden study linked CD to some other health problems, ranging from neurodevelopmental and psychiatric disorders to somatic complaints [31]. A USA study associated childhood CD with an increased risk of psychiatric disorders, which persists into adulthood, therefore the researchers proposed mental health examination in the care of CD [32]. Another USA study concluded that CD patients were at increased risk of having multiple psychiatric diseases including anxiety, depression, bipolar, ADHD, eating disorder, and autism [33]. In an Iranian study, anxiety symptoms were common among patients, especially among women [34]. A Turkey study associated with female sex, mild histopathological form, and human leukocyte antigen DQ2 heterozygosity to neurological manifestations, and associated human leukocyte antigen DQ2 heterozygosity with headache in CD [35]. A Turkey study evaluated all CD patients on GFD as mildly anxious [36]. The awareness of those CD-associated psychiatric and behavioral entities might have increased the rate of CD diagnosis.

2.2.2. B2. Type 1 diabetes

A German study associated CD and depression with young type 1 diabetes (T1D) patients [37]. In SUA, in the first 10 years of life, from prospectively collected serial growth measurements, no evidence of damaged childhood growth before CD and CD autoimmunity development as identified through early and periodic screening were found [38]. The prevalence and the anthropometric and metabolic consequences of CD in children with T1D differ around the world [39]. A Poland study concluded that the number of children diagnosed with other autoimmune diseases that go with T1D was rapidly growing in all age groups throughout recent years [40]. In another USA study associated with higher rates of renal failure, ischemic stroke, and myocardial infarction with patients with T1D, particularly women [41]. Since T1D patients are routinely screened for CD associated serology, it might have enhanced CD diagnosis.

2.2.3. B3. Inflammatory bowel disease and inflammatory bowel syndrome

CD was common in inflammatory bowel disease (IBD) patients from Saudi Arabia, especially those with criteria-positive diagnosis [42]. An Italian study observed a higher risk for autoimmune diseases, colectomy, and pubertal delay compared with IBD alone in children with IBD and CD [43]. A Canadian study revealed an increased risk of IBD in patients with CD and an increased risk of CD in patients with IBD, compared with other patient populations [44]. A multi-center study gives an important role in the diagnosis of the family history of IBD or CD [45]. A Poland-Portugal study discussed if CD and IBD are true CD and IBD or just CD-like and IBD-like diseases in common variable immunodeficiency patients [46]. In an Italian study, the conclusion was that the possible interplay between irritable bowel syndrome and GRDs represents a scientifically and clinically challenging issue [47]. Inflammatory bowel syndrome and IBD are quite frequent and are occasionally connected to CD [1,48]. Their associations might have increased CD diagnostic rates.

2.2.4. B4. Eating disorders and nutritional deficiencies

Disordered eating was not a well-understood phenomenon in diet-related chronic illnesses (e.g., CD, T1D, and IBD) among Hungary adolescents [49]. In an Italian case report, CD manifested abruptly with a severe malabsorption syndrome, that is, electrolyte abnormalities and hypoproteinemia [50]. In a Spain study, the diet of CD children was nutritionally less balanced than that of the control [51]. The researcher recommended monitoring nutrition in patients on a GFD in another Italian study [52]. A USA study recommended the primary care provider to CD children on GFD [53]. Eating disorders and nutritional deficiencies are a worldwide concern [54] and the association to CD might have increased the awareness to search for CD diagnosis.

2.3. CD and COVID-19

The link between CD and COVID-19 has been extensively researched in Italy. Patients with CD do not bear a risk of COVID-19 correlated to the general population, and their disease line was mild. Clinical type of CD, age, sex, duration, and adherence to a GFD, and mucosal healing did not differ between CD patients with and without COVID-19 [55]. But the restrictions applied to COVID-19 can impact CD treatment and GFD, the only available therapy for CD [56]. The lockdown attends to a reported improved adherence to the GFD in one-third of the respondents, in particular in those with earlier poor disease control, offering the opportunity to avoid sources of contamination/transgression and expand the use of naturally gluten-free products [57]. A potentially life-threatening delay in the diagnosis of CD was also reported [58]. The COVID-19 pandemic has affected patients with CD; in particular, women, elderly patients, patients with other comorbidities [59]. Most recently, the relationships between COVID-19, the gastrointestinal tract, and CD were highlighted [60,61]. CD and COVID-19 are prevalent in the elderly and the gastrointestinal functional senescence contributes to COVID-19 elderly affected mortality [62,63].

2.4. Conclusions

Health education to follow the GFD does not exist in many countries. Unfortunately, the COVID-19 pandemic has increased psychological problems among patients with CD. The association of T1D with CD has been and remains a problem in CD management. Associating IBD with CD is again a challenge. Psychological problems also appeared in the associations of CD with T1D and IBD. The COVID-19 virus did not pose an increased risk to CD patients, but the COVID-19 pandemic brought many psychological problems to CD patients. CD patients should adhere to GFD, in general, hence pay attention to gluten withdrawal during the COVID-19 pandemics, to avoid other complications and improve their QOL.

Declaration of competing interests

None.

Autor contributions

G.S. and A.L designed the study and screened the literature, carried out, and wrote this study. The two authors contributed to the article and approved the submitted version. All authors have read and agreed to the published version of the manuscript.

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