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Second Screening for Celiac Disease in First-Degree Relatives of Pediatric Index Cases: A Single-Center Observational Study

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ABSTRACT

Objective: This study investigated new seropositivity detected during repeat screening among first-degree relatives of pediatric index cases with celiac disease (CD) who were seronegative at initial screening.

Materials and Methods: This single-center, observational, family-based screening study was conducted at a tertiary pediatric gastroenterology center. First-degree relatives of 117 pediatric index cases with biopsy-confirmed CD were invited for screening. CD screening was performed using tissue transglutaminase immunoglobulin A, with tissue transglutaminase immunoglobulin G used in cases of low total immunoglobulin A. Individuals with seropositivity underwent upper gastrointestinal endoscopy with duodenal biopsy. Histopathologic findings were evaluated according to the Marsh classification. Among participants with negative initial serology, those whose first screening had been performed at least 1 year earlier underwent repeat serologic screening.

Results: Of the 462 invited first-degree relatives, 376 participated in the initial screening. Seropositivity was detected in 5.6% of participants, and biopsy-confirmed CD was established in 5.0%. Among the 355 individuals with negative initial serology, 101 underwent repeat screening after a median interval of 3.0 years. New seropositivity was detected in 4 of these 101 individuals [3.9%; exact binomial 95% CI: 1.1–9.8], and all had biopsy-confirmed CD. Three of the newly identified cases were siblings who had been screened in early childhood. No significant association was found between the presence of symptoms and serologic positivity at either screening.

Conclusion: First-degree relatives of pediatric patients with CD represent a high-risk group in whom new seropositivity may emerge over time. Repeat screening, particularly in relatives first screened during early childhood, may improve case detection.

Keywords: Biopsy, diet, early diagnosis, endoscopy, gluten-free, Marsh classification.

INTRODUCTION

Celiac disease (CD) is an immune-mediated enteropathy triggered by gluten ingestion in genetically susceptible individuals, with a clinical spectrum ranging from asymptomatic disease to overt malabsorption.[1,2] Although the prevalence of CD in the general population has been reported to be approximately 1% to 1.65%, the biopsy-confirmed prevalence among healthy schoolchildren in Türkiye has been reported to range from 0.46% to 0.63%.[2–6] Among first-degree relatives, however, the prevalence is substantially higher, with rates ranging from approximately 4.2% to 15% across studies.[1,6–8] In addition, a considerable proportion of cases identified through family screening may be asymptomatic, indicating that a symptom-based approach alone may be insufficient.[9,10]

Accordingly, current literature recommends serologic screening for first-degree relatives of individuals with CD.[2,8] However, the optimal follow-up strategy for relatives with negative initial screening results remains unclear. Although previous studies have shown that a single screening assessment may be insufficient and that new seropositivity may emerge over time, no standard approach has been established regarding which individuals should undergo repeat screening, which age groups should be prioritized, or what rescreening interval would be most appropriate.[2,11,12] In particular, cases with negative initial results during childhood but subsequent development of new seropositivity during follow-up suggest that family screening at a single time point may not be adequate.[8,11,12]

This study aimed to investigate newly detected seropositivity identified by repeat screening among first-degree relatives of pediatric index cases with CD who were seronegative at initial screening.

KEY MESSAGES

- Initial screening detected seropositivity in 5.6% of first-degree relatives and biopsy-confirmed celiac disease in 5.0%.
- Among initially seronegative relatives retested after at least 1 year, new seropositivity was detected in 3.9%, and all cases were biopsy-confirmed.
- Repeat screening may improve case detection, particularly in relatives first screened during early childhood, because symptoms did not distinguish seropositive individuals from seronegative individuals.

MATERIALS AND METHODS

Study Setting and Design

This was a single-center, observational, family-based screening study conducted among first-degree relatives of pediatric index cases with CD at the Division of Pediatric Gastroenterology, Gulhane Training and Research Hospital. During the study period, from May 2025 to February 2026, first-degree relatives of 117 index cases aged 0–18 years who had been diagnosed with CD according to the 2012 or 2020 European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) guidelines and had biopsy-confirmed diagnoses were evaluated for screening.[13,14]

Ethics Approval/Informed Consent

This study was approved by University of Health Sciences Gulhane Scientific Research Ethics Committee (Approval Number: 2025-267, Date: 06.05.2025). All stages of the study were conducted in accordance with the principles of the Declaration of Helsinki, as revised in 2013. Verbal and written information about the study was provided to all participants or to the legal guardians of individuals younger than 18 years, and written informed consent was obtained.

Participant Selection and Screening Approach

During the study period, first-degree relatives of index cases presenting to the outpatient clinic were invited to participate in the screening program, and those who agreed to participate constituted the study group. For individuals who had not previously undergone CD screening, the first serologic screening was performed as part of the study.

For those who had previously undergone serologic evaluation, earlier screening results were obtained from the hospital information system and the e-Nabız system. In individuals whose previous first screening had demonstrated seropositivity and/or in whom CD had been diagnosed, the available records were reviewed to confirm that the diagnosis was consistent with the 2012 or 2020 ESPGHAN guidelines, and these results were recorded as the first screening data.[13,14]

Among individuals whose first serologic evaluation was negative, all those whose previous assessment had been performed at least 1 year earlier were included in the second serologic screening. The study flow is presented in Figure 1.

Before study enrollment, prior adherence to a gluten-free diet was also assessed in individuals without a previous diagnosis of CD; however, no participant was found to be fully following a gluten-free diet.

For all participants, degree of relationship, age, sex, presence of symptoms, age at first screening, age at second screening when applicable, and the interval between the two screenings were recorded.

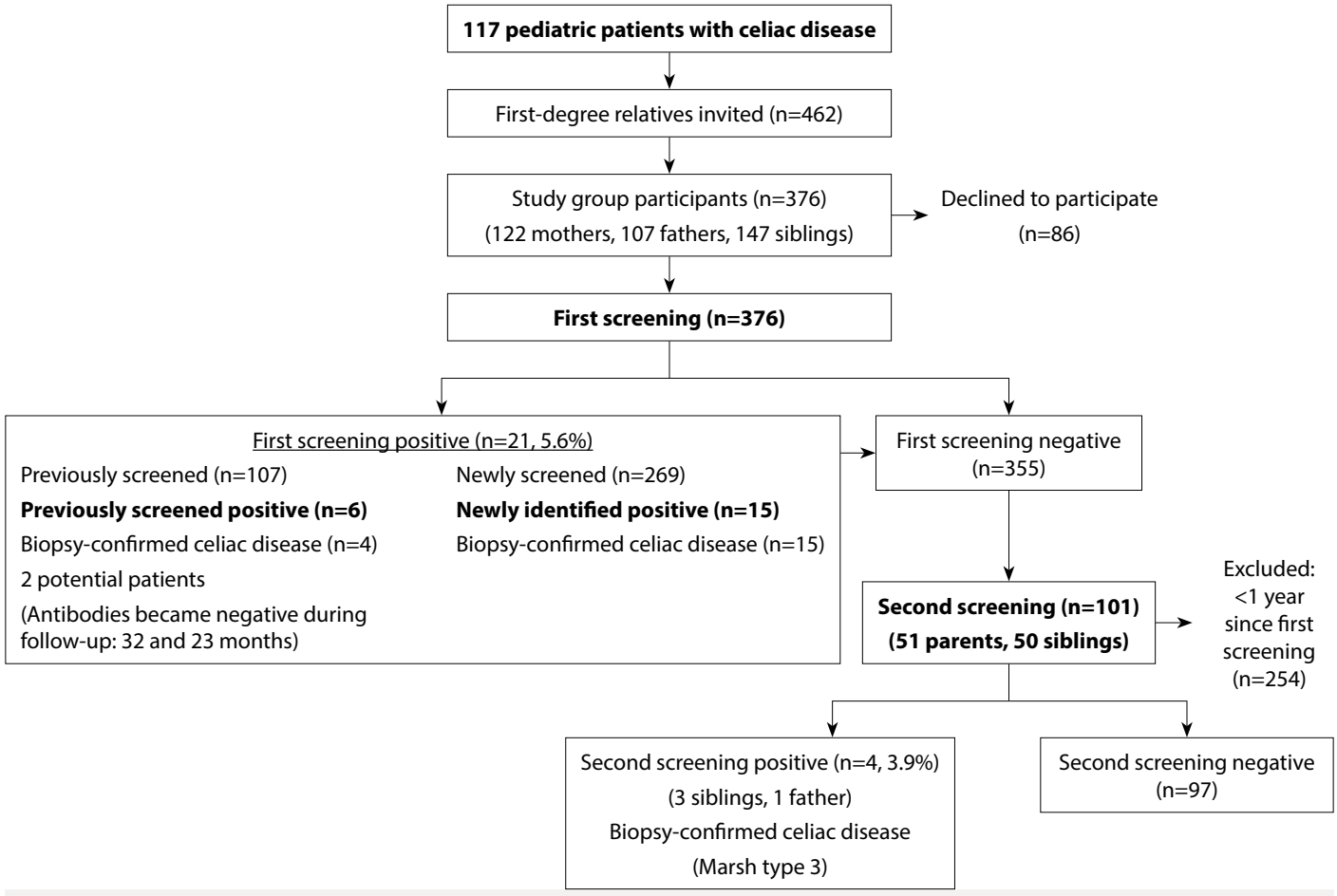

Figure 1. Flow diagram of participant selection and screening process.

Serologic Evaluation

In the first and second screening tests performed at our hospital, serum tissue transglutaminase immunoglobulin A (tTG-IgA) levels >10 U/mL were considered positive. Because the serologic tests obtained from previous records had been performed in different laboratories using different commercial kits, positivity was defined according to the upper limit of normal specified by the relevant laboratory or kit manufacturer for each test. CD screening was performed using tTG-IgA and total immunoglobulin A (IgA) tests. In individuals with low total IgA levels, the evaluation was completed using tissue transglutaminase immunoglobulin G (tTG-IgG). In tests performed at our hospital, tTG-IgA and tTG-IgG levels were measured using enzyme-linked immunosorbent assay (ELISA) (Alegria®, ORGENTEC Diagnostika GmbH, Mainz, Germany).

Clinical Evaluation and Endoscopic Examination

All participants were questioned in detail about gastrointestinal and extraintestinal manifestations associated with CD, including diarrhea, vomiting, abdominal pain, weight loss, constipation, fracture history, dermatitis herpetiformis, growth retardation, and anemia. Endoscopic tissue sampling was recommended for all participants with seropositivity on serologic screening, and all agreed to undergo the procedure. In pediatric participants, the procedures were performed by the same pediatric gastroenterologist, whereas in adult participants, all procedures were performed by the same adult gastroenterologist. All endoscopic procedures were performed under deep sedation in the presence of an anesthesiology specialist. The Fujinon Eluxeo VP-7000/BL-7000 endoscopy system (Fujifilm Corporation, Tokyo, Japan) was used for all procedures. Written informed consent was obtained from the patients and/or their parents or legal guardians before the procedure.

Histopathologic Evaluation and Diagnostic Criteria

A total of 6 tissue samples were obtained from all individuals who underwent endoscopy, including 2 from the duodenal bulb and 4 from the postbulbar duodenum. Histopathologic evaluation was performed according to the Marsh

classification.[15] Individuals with histopathologic findings compatible with Marsh type 2 or type 3 were diagnosed with CD. In this study, new diagnoses were established in accordance with the ESPGHAN 2020 criteria; however, the no-biopsy diagnostic approach was not applied.[14]

Sample Size and Power Analysis

For the first screening stage, the sample size was justified using an a priori power analysis based on the lowest prevalence estimate reported for first-degree relatives in the literature. Assuming a CD prevalence of 1.0% in the general population and a conservative expected prevalence of 4.2% among first-degree relatives, a one-tailed exact binomial test was performed using G*Power 3.1.9.7.[1,7] With an effect size g of 0.032, α=0.05, and 95% power, the minimum required sample size was calculated as 248 participants. The inclusion of 376 participants in the first screening stage exceeded this minimum requirement.

For the second screening stage, a separate a priori power analysis was not performed because this subgroup was determined by the number of initially seronegative participants who were eligible for repeat testing after at least 1 year. Therefore, the second screening analysis was considered an exploratory follow-up analysis within the predefined eligible cohort. To support interpretation of the follow-up yield, the observed new seropositivity rate was presented with an exact binomial 95% confidence interval.

Statistical Analysis

Categorical variables were presented as numbers and percentages, whereas continuous variables were presented as medians, interquartile ranges (IQRs), and minimum–maximum values, as appropriate. The normality of continuous variables was assessed using the Shapiro–Wilk test and visual inspection of histograms. Because the data were not normally distributed, continuous variables were compared using the Mann–Whitney U test. Categorical variables were compared using Fisher's exact test. Effect sizes were reported as r for Mann–Whitney U tests and phi coefficients (φ) for categorical comparisons. All comparative statistical tests were two-tailed, and $p<0.05$ was considered statistically significant. Statistical analyses were performed using IBM Statistical Package for the Social Sciences (SPSS) Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA).

RESULTS

Participant Flow

During the study period, a total of 462 first-degree relatives of index cases presenting to the outpatient clinic were invited for screening. Among those invited, 376 individuals agreed to participate and constituted the main study group. Of the 355 individuals who were seronegative at the initial screening, 101 whose first screening had been performed at least 1 year earlier were included in the second screening analysis (Fig. 1).

First Screening Results

Of the 376 individuals included in the study group, 195 were female and 181 were male, with a median age of 31.0 years (IQR: 12.0–39.0; range: 2–59). Among the participants, 229 were parents (122 mothers and 107 fathers), whereas 147 were siblings (73 girls and 74 boys). The median age was 37.0 years (IQR: 33.0–43.0) for parents and 10.0 years (IQR: 6.0–13.5) for siblings.

At the first serologic screening, CD seropositivity was detected in 21 of the 376 individuals (5.6%). The seropositivity rate was 3.9% among parents (n=9; 5 mothers and 4 fathers) and 8.2% among siblings (n=12). Of the 21 seropositive individuals, 19 were diagnosed with biopsy-confirmed CD. Histopathologic examination showed Marsh type 2 in 1 case and Marsh type 3 in 18 cases. In 1 mother aged 36 years and 1 sibling aged 12 years with seropositivity, biopsy results were reported as Marsh 0–1. During follow-up, tTG-IgA levels remained negative for 32 and 23 months, respectively, in these 2 individuals (Fig. 1).

Second Screening Results

Among the 355 individuals who were seronegative at the initial screening, 101 participants (55 females and 46 males) whose first screening had been performed at least 1 year earlier underwent second screening. The median interval between the two screenings was 3.0 years (IQR: 2.0–4.0; range: 1.0–11.0). Of the follow-up group, 51 were parents (30 mothers and 21 fathers), whereas 50 were siblings (25 girls and 25 boys). At the time of the second screening, the median age was 38.0 years (IQR: 34.0–40.0) in the parent group and 11.0 years (IQR: 6.3–15.0) in the sibling group. Screening results according to age distribution are presented in Figure 2.

At the second serologic screening, new CD seropositivity was detected in 4 of the 101 individuals [3.9%; exact binomial 95% CI: 1.1–9.8], and all were diagnosed with biopsy-confirmed CD. Because only 4 individuals tested positive at the second screening, this finding should be interpreted descriptively and with caution. The characteristics of these individuals are presented in Table 1.

Relationship Between Symptom Presence and Serologic Status

At both screenings, no significant difference was found in symptom presence between seropositive and seronegative individuals (Table 2).

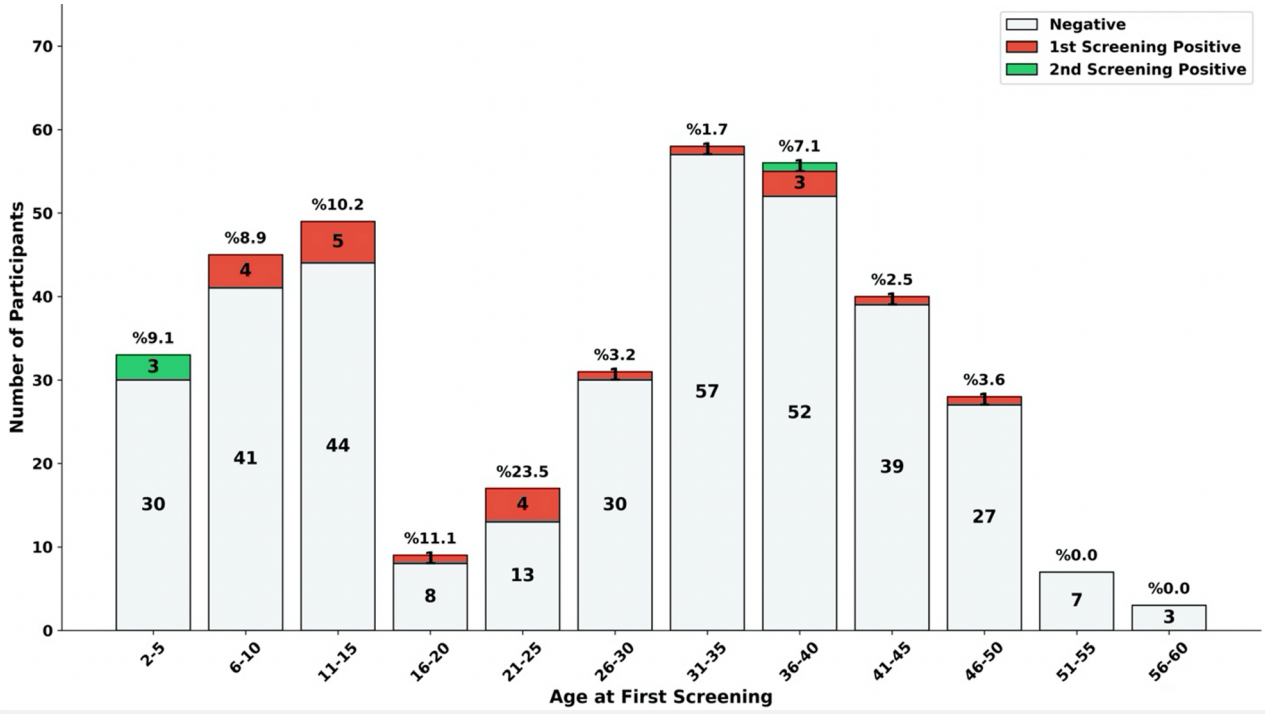

Figure 2. First and second screening results according to age distribution. The numbers within the columns indicate the number of participants in each group, while the percentages (%) above the columns represent the overall celiac screening positivity rate for the corresponding age group.

Table 1. Characteristics of individuals newly diagnosed with celiac disease at the second screening

Participant	Degree of relationship	Sex	Age at first screening, years	Age at second screening, years	Symptom	Marsh classification
1	Sibling	Female	2	9	None	Type 3b
2	Sibling	Female	2	6	Mild malnutrition	Type 3c
3	Sibling	Male	3	9	None	Type 3c
4	Father	Male	39	42	Constipation	Type 3b

DISCUSSION

In this family screening study conducted among first-degree relatives of pediatric index cases with CD, seropositivity was detected in 21 of 376 individuals (5.6%) at the initial screening, and CD was biopsy-confirmed in 19 of them (5.0%). At the initial screening, the seropositivity rate was numerically higher in siblings than in parents (8.2% vs. 3.9%). Among the 101 individuals who were seronegative at the initial screening and reassessed at least 1 year later, new seropositivity was detected in 4 (3.9%), and biopsy-confirmed CD was established in all of them. The finding that 3 of these newly identified cases were siblings who were 2–3 years old at the first screening and diagnosed at 6–9 years of age at the second screening suggests that repeat screening may contribute to the detection of new cases, particularly in children first screened during early childhood. In addition, the absence of a significant association between symptom presence and serologic positivity at either screening indicates that a screening approach based solely on clinical complaints may be insufficient in family-based screening.

Our findings are consistent with the literature showing that the prevalence of CD is substantially higher in first-degree relatives than in the general population. Doğan et al.[1] reported a biopsy-confirmed prevalence of 4.8% in 484 first-degree relatives, whereas Bonamico et al.[16] reported a prevalence of 9.5%. In the study by Singla et al.,[17] the biopsy-confirmed prevalence was 8.9%, while Wessels et al.[8] reported a prevalence of 15% among screened relatives. More recently, a meta-analysis including 34 studies and 10,016 first-degree

Table 2. Comparison of age, sex, and symptom status according to serologic status at the first and second screenings

Variable	First screening negative (n=355)	First screening positive (n=21)	p	Effect size	Second screening negative (n=97)	Second screening positive (n=4)	p	Effect size
Age, years, median (IQR)	32 (12.0–39.0)	21 (14.0–35.0)	0.265[u]	r=0.057	31 (12.0–38.0)	9 (8.0–17.0)	0.299[u]	r=0.103
Female, n (%)	185 (52.1)	10 (47.6)	0.822[f]	φ=0.018	53 (54.6)	2 (50.0)	1.000[f]	φ=0.003
Symptomatic, n (%)	69 (19.4)	6 (28.6)	0.396[f]	φ=0.047	25 (25.8)	2 (50.0)	0.290[f]	φ=0.117

u: Mann–Whitney U test; f: Fisher's exact test. IQR: Interquartile range (25–75th percentiles). Effect sizes are presented as r for Mann–Whitney U tests and phi coefficients (φ) for categorical comparisons.

relatives reported a pooled seroprevalence of 11% and a biopsy-confirmed prevalence of 7%.[18] In addition, Ahmadipour et al.[19] found a prevalence of 8.6% in a cohort including only siblings, whereas the Mayo Clinic cohort reported rates as high as 44.4% among screened first-degree relatives; this suggests that the observed frequency may be influenced by screening intensity, study methodology, and the characteristics of selected cohorts.[9,19] Taken together, these data clearly indicate that first-degree relatives constitute a high-risk group for CD.

When evaluated in terms of age-related risk, the available evidence supports the importance of repeat screening, particularly during childhood. Wessels et al.[8] showed that repeat testing is warranted in human leukocyte antigen (HLA)-DQ2/DQ8-positive first-degree relatives, especially those younger than 10 years of age when the index case was diagnosed, and that a substantial proportion of children who were 0–1 years old at initial evaluation were identified through serial screening within a mean period of 3.9±2.5 years. Paavola et al.[12] likewise reported, over approximately 10 years of follow-up, that individuals with a new diagnosis or new seropositivity were younger at baseline screening, with a first screening age of 23.3 years compared with 40.5 years.[12] Similarly, in the study by Ahmadipour et al.,[19] 75% of newly diagnosed siblings were ≤15 years of age, further supporting the importance of screening during childhood and early adolescence. In our study, 3 of the 4 newly identified cases at the second screening were siblings who had first been screened in early childhood, suggesting that a single negative test may not be sufficient to reliably exclude the disease in this age group. We also identified 1 father who developed seropositivity 3 years after a negative first screening; however, larger studies are needed to clarify the potential role of repeat screening in adults.

The inadequacy of a symptom-based approach is another important finding of our study. Gould et al.[10] showed that 51% of children screened because of an affected first-degree family member were asymptomatic, despite having histologic severity comparable to that of other diagnostic groups. Similarly, Goldberg et al.[11] reported a 3.5% rate of new seropositivity on repeat evaluation of 171 family members whose initial screening results were negative; most of these individuals were asymptomatic, and no change in symptoms was observed during follow-up. Paavola et al.[12] also found no significant differences in current symptoms or comorbidities between newly identified cases and unaffected relatives. Likewise, in the study by Nellikkal et al.,[9] only 6% of first-degree relatives who were diagnosed had classical symptoms, whereas 66% had nonclassical symptoms and 28% were asymptomatic, suggesting that silent or subtle clinical presentations may predominate in family screening. Therefore, in individuals with a family history, screening should not be based on the presence of symptoms alone.

The strengths of our study include endoscopic confirmation in all seropositive cases and the inclusion of repeat testing after an initially negative screening. In addition, siblings and parents were evaluated separately, making the distribution of risk more clearly visible. However, several limitations should also be acknowledged. Repeat screening was restricted to individuals whose first screening had been performed at least 1 year earlier; therefore, the follow-up findings should be interpreted within this predefined follow-up framework and may not fully represent all individuals who were seronegative at the initial screening. In addition, only 4 individuals tested positive at the second screening; therefore, these findings should be interpreted cautiously as the observed diagnostic yield within this predefined single-center follow-up cohort and should not be generalized to all first-degree relatives. The absence of HLA-based risk stratification also limits direct comparison with the risk-based repeat screening strategies proposed in the literature.[8,12,16] In addition, because the initial screening data were obtained from different laboratories using different commercial kits, standardization of the serologic results may have been limited. Although tTG-IgA is accepted as the preferred first-line test for the diagnosis of CD because of its high sensitivity and specificity, the lack of endomysial antibody assessment in our study may have limited serologic confirmation.[6,14,20]

CONCLUSION

This family-based screening study showed that new seropositivity can be detected both at initial screening and on repeat evaluation among first-degree relatives of pediatric index cases with CD. The occurrence of new seropositivity during follow-up, particularly in siblings whose initial screening was negative in early childhood, suggests that repeat screening may provide additional diagnostic yield in selected relatives. In addition, the inability of symptom presence to distinguish serologic positivity supports that a screening strategy based solely on clinical complaints may be inadequate in family screening.

Ethics Committee Approval: Ethics committee approval was obtained from University of Health Sciences Gulhane Scientific Research Ethics Committee (Approval Number: 2025-267, Date: 06.05.2026).

Informed Consent: Written informed consent was obtained from the participants.

Conflict of Interest: The authors have no conflicts of interest to declare.

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Author Contributions: Concept – ST, NB; Design – ST, RE; Supervision – NB, YME; Materials – ST, RE; Data Collection and/or Processing – ST, BIA, RE, EGB; Analysis and/or Interpretation – ST, YME; Literature Review – ST, YME, BIA, RE; Writing – ST; Critical Review – YME, NB.

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REFERENCES

1. Doğan Y, Yildirmaz S, Ozercan IH. Prevalence of celiac disease among first-degree relatives of patients with celiac disease. J Pediatr Gastroenterol Nutr 2012;55(2):205-8. [CrossRef]
2. Singh P, Singh AD, Ahuja V, Makharia GK. Who to screen and how to screen for celiac disease. World J Gastroenterol 2022;28(32):4493-507. [CrossRef]
3. Lionetti E, Pjetraj D, Gatti S, Catassi G, Bellantoni A, Boffardi M, et al. Prevalence and detection rate of celiac disease in Italy: Results of a SIGENP multicenter screening in school-age children. Dig Liver Dis 2023;55(5):608-13. [CrossRef]
4. Ertekin V, Selimoğlu MA, Kardaş F, Aktaş E. Prevalence of celiac disease in Turkish children. J Clin Gastroenterol 2005;39(8):689-91. [CrossRef]
5. Comba A, Eren NB, Demir E. Prevalence of celiac disease among school-age children in Çorum, Turkey. Turk J Gastroenterol 2018;29(5):595-600. Erratum in: Turk J Gastroenterol 2018;29(6):722. [CrossRef]
6. Dalgic B, Sari S, Basturk B, Ensari A, Egritas O, Bukulmez A, et al.; Turkish Celiac Study Group. Prevalence of celiac disease in healthy Turkish school children. Am J Gastroenterol 2011;106(8):1512-7. Erratum in: Am J Gastroenterol 2011;106(8):1565. [CrossRef]
7. Uenishi RH, Gandolfi L, Almeida LM, Fritsch PM, Almeida FC, Nóbrega YK, et al. Screening for celiac disease in 1st degree relatives: a 10-year follow-up study. BMC Gastroenterol 2014;14:36. [CrossRef]
8. Wessels MMS, de Rooij N, Roovers L, Verhage J, de Vries W, Mearin ML. Towards an individual screening strategy for first-degree relatives of celiac patients. Eur J Pediatr 2018;177(11):1585-92. [CrossRef]
9. Nellikkal SS, Hafed Y, Larson JJ, Murray JA, Absah I. High Prevalence of Celiac Disease Among Screened First-Degree Relatives. Mayo Clin Proc 2019;94(9):1807-13. [CrossRef]
10. Gould MJ, Dowhaniuk J, Arredondo J, Azzopardi P, Hu T, Mileski H, et al. Characteristics of Pediatric Patients With Celiac Disease Identified Due to an Affected First-Degree Family Member. J Pediatr Gastroenterol Nutr 2023;76(1):49-52. [CrossRef]
11. Goldberg D, Kryszak D, Fasano A, Green PH. Screening for celiac disease in family members: is follow-up testing necessary? Dig Dis Sci 2007;52(4):1082-6. [CrossRef]
12. Paavola S, Kurppa K, Huhtala H, Saavalainen P, Lindfors K, Kaukinen K. Coeliac disease re-screening among once seronegative at-risk relatives: A long-term follow-up study. United European Gastroenterol J 2022;10(6):585-93. [CrossRef]
13. Husby S, Koletzko S, Korponay-Szabó IR, Mearin ML, Phillips A, Shamir R, et al.; ESPGHAN Working Group on Coeliac Disease Diagnosis; ESPGHAN Gastroenterology Committee; European Society for Pediatric Gastroenterology, Hepatology, and Nutrition. European Society for Pediatric Gastroenterology, Hepatology, and Nutrition guidelines for the diagnosis of coeliac disease. J Pediatr Gastroenterol Nutr 2012;54(1):136-60. Erratum in: J Pediatr Gastroenterol Nutr 2012;54(4):572. [CrossRef]
14. Husby S, Koletzko S, Korponay-Szabó I, Kurppa K, Mearin ML, Ribes-Koninckx C, et al. European Society Paediatric Gastroenterology, Hepatology and Nutrition Guidelines for Diagnosing Coeliac Disease 2020. J Pediatr Gastroenterol Nutr 2020;70(1):141-56. [CrossRef]

15. Oberhuber G, Granditsch G, Vogelsang H. The histopathology of coeliac disease: time for a standardized report scheme for pathologists. Eur J Gastroenterol Hepatol 1999;11(10):1185-94. [CrossRef]
16. Bonamico M, Ferri M, Mariani P, Nenna R, Thanasi E, Luparia RP, et al. Serologic and genetic markers of celiac disease: a sequential study in the screening of first degree relatives. J Pediatr Gastroenterol Nutr 2006;42(2):150-4. [CrossRef]
17. Singla S, Kumar P, Singh P, Kaur G, Rohtagi A, Choudhury M. HLA Profile of Celiac Disease among First-Degree Relatives from a Tertiary Care Center in North India. Indian J Pediatr 2016;83(11):1248-52. [CrossRef]
18. Karimzadhagh S, Abbaspour E, Ghodous S, Poursadrolah S, Jafari M, Mazloom S, et al. Global Prevalence and Clinical Manifestations of Celiac Disease Among First-Degree Relatives: A Systematic Review and Meta-Analysis. Am J Gastroenterol 2024;120(7):1488-501. [CrossRef]
19. Ahmadipour S, Rostami Nejad M, Soleimani S, Mahmoudvand G, Anbari K, Rouzbahan AK. Celiac Disease Screening in the Siblings of Pediatric Patients with a Confirmed Diagnosis: A Cross-sectional Study. J Compr Ped 2023;14(1):e132834. [CrossRef]
20. Kumral D, Syed S. Celiac Disease Screening for High-Risk Groups: Are We Doing It Right? Dig Dis Sci 2020;65(8):2187-95. Erratum in: Dig Dis Sci 2020;65(9):2743. [CrossRef]