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ACTA PÆDIATRICA NURTURING THE CHILD WILEY

BRIEF REPORT

Point-of-Care test screening versus Case finding for paediatric coeliac disease: A pragmatic study in primary care

In paediatric coeliac disease (CD), symptoms may not be a reliable factor in the diagnosis of coeliac disease as described by Rosen et al,[1] and thus, recommendations for reviewing CD screening criteria were suggested.[2] Apart from the costs, an important limiting factor in paediatric population mass screening using conventional immunoglobulin (Ig) A tissue transglutaminase (tTGIgA) may be the low compliance of asymptomatic children to be referred for testing. On the other hand, the alternative approach, the CF strategy, relies on selecting the individuals to be tested for CD, in the presence of conditions known to be associated with CD, by the family paediatrician. However, search for CD would be more effective if family paediatricians (FPs) were provided with a less invasive, cheap point-of-care test (POCT), to administer to children they have in care.

Recently, the need to estimate the benefits and the economic aspects of CD screening was emphasised.[3]

The aim of the present prospective study was to evaluate diagnostic yield and cost consequences of a point-of-care test-based screening regardless of symptoms versus case finding, for the detection of coeliac disease in paediatric primary care.

Once having obtained informed consent from the family and children, 44 FPs offered a POCT (the 'new-generation' Biocard™ coeliac test, AniBiotech®), for tTG IgA to children that consecutively attended their offices.

Exclusion criteria were as follows: age < 1 year, a previous diagnosis of CD, a gluten-free diet, use of medicines that can affect results, such as immunosuppressors, a serological test for CD in the last 12 months or fever at the moment of the visit.

Ethical approval was obtained from the Ethics Committee of the University Hospital where the Celiac Regional Center coordinating the study is allocated. The study has been performed in accordance with the ethical standards of the Declaration of Helsinki of 1975 as revised in 1983.

The POCT, performed as previously described,[4] is positive if two lines are seen and negative if only the control line (with an antihuman IgA antibody) forms. If no line is visible, IgA deficiency should be suspected.

POCT was performed by paediatricians (70 tests each) participating in the study.

Symptoms and conditions associated with CD suggested by ESPGHAN guidelines[5] were recorded, while parents and FPs were blinded to the results of the POCT.

All positive POCT and no line subjects were referred to coeliac centres to undergo conventional enzyme-linked immunosorbent assay for tTG IgA or IgG tissue transglutaminase antibodies, respectively, with one of the kits recommended by ESPGHAN.[5] Serum total IgA was also measured in subjects with no line at POCT, in view of the suspicion of having IgA deficiency. According to the study design as approved by Ethics Committee, only symptomatic subjects at CF with negative POCT but not the asymptomatic ones were referred to coeliac centre to have a paediatric gastroenterology consultation and conventional tTG IgA, and thus, the negative predictive value of POCT was not calculated.

In subjects with positive serology, a histological examination and diagnosis were made according to ESPGHAN guidelines.[5]

To assess the cost consequences of the different strategies, through a bottom-up approach and to regional health system perspective, only direct medical costs actually reimbursed by the region were taken into account. Two sensitivity analyses were developed for evaluating the strength of the results. In the first one, a cost of + 20% for POCT was used, while in the second one, to compare POCT screening strategy vs CF, a cost for each FP visit of €15.44 was added to every patient in the CF.

The results are shown in the diagram of participants (mean age 5.7 years; age range 12 months-14 years, F/M ratio: 1.16) through the study in Figure 1.

Eleven children, detected by POCT screening, would not have been detected as having CD because they did not have symptoms and were brought to paediatricians' offices for routine healthy controls.

Seventy tests showed no line. In this group, none had IgA deficiency and none was diagnosed as having CD (Figure 1).

In the base case scenario, a mean cost for each diagnosed CD patient of €683.30 was estimated. Instead, for CF strategy a mean cost of €790.78 per diagnosed CD patient was assessed. These costs increased to €786.65, in the first sensitivity analysis, and to €11 002, in the second sensitivity analysis, for POCT and CF, respectively.

Our results suggest that if a case finding strategy only had been used, 11 patients disclosed by screening would have been missed. In view of this, it appears that POCT screening is a superior strategy to aid diagnosis of CD in children. These results are in keeping with those of Rosen et al.[1]

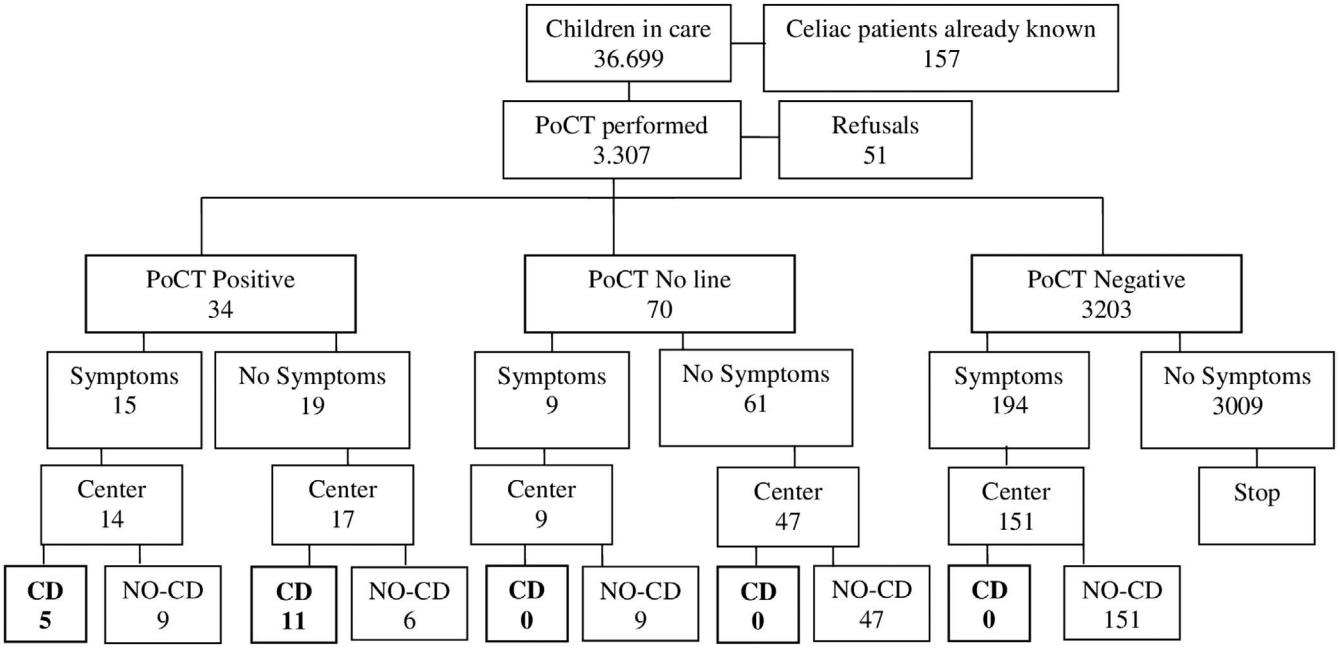

FIGURE 1 Flowchart of study patient enrolment

Regarding the cost consequences, the POCT strategy, despite being costlier than CF, showed a 14% lower cost for each patient diagnosed with CD.

We are aware that the most important limitation of the present study is that we were not able to calculate the predictive negative value of POCT because, according to the study design as approved by ethics committee, we did not refer asymptomatic children with POCT negative to coeliac centres, and only 75% of POCT negative symptomatic children underwent conventional serology due to refusal after the POCT turned-out to be negative. For this reason, we suggest that paediatricians utilise POCT in asymptomatic children only and refer children with clinical suspicion of CD for undergoing conventional serology; otherwise, testing for CD might be slowed down by a negative POCT.

Despite its low positive predictive value (47.1%), balanced by the very low cost, and even if 'no line result' does not correspond to IgA deficiency (but no coeliac was missed), POCT may be a useful and economic option for screening asymptomatic children and seems more convenient than a case finding strategy to bridge the diagnostic gap of CD in children.

These results may become more relevant utilising a next-generation POCT with better positive predictive value. More studies are needed to assess whether our screening strategy may be applied in other regions and countries.

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CONFLICTS OF INTEREST

No conflict of interest to declare.

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