

## Epidemiology of coeliac disease

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### Abstract

In this article we review recent worldwide epidemiological data of coeliac disease (CD). An emphasis is made on adult figures as there is reduction of infants cases that is counterbalanced by the increase of CD in older children or adults.

We review data from Europe, USA, South America, Australia, Asia and Africa.

Studies in mixed population and in patients undergoing endoscopy are also mentioned. The prevalence of the disease varies between 1/100-500 in different continents.

It is possible that the low incidence of CD in some regions is due to the decrease of the prevalence of classic form of the disease. (*Acta gastroenterol. belg.*, 2003, 66, 234-236).

**Key words:** coeliac disease, epidemiology, Europe, USA, South America, Australia, endoscopy, adults.

### Introduction

The diagnosis and screening for coeliac disease (CD) has been dramatically facilitated by testing for gliadin and endomysium antibodies although histological confirmation remains the gold standard in serologically positive persons (1).

The reduction, at least in Europe, in typical cases in young children (2), was highly counterbalanced by the increase of CD in older children or in adults (3).

We decided to review recent data about incidence and prevalence of CD in adults or adolescents.

### Material and methods

Recent articles were included in this paper all using the classical screening of CD (antibodies and histological confirmation).

Most of the studies were done in blood donors, or in primary care facilities.

Prevalence and rarely incidence of the disease are mentioned as well as the period (year or years) of the study.

### Results

#### *CD in Europe*

The prevalence of CD varies greatly if we take into account studies done since 1950 all over the continent. However studies done in the last ten years, situates CD not only as one of the most common chronic disorders but also shows that the disease could be less variable among countries than previously thought.

In Italy, in a study done in 1996 (4), 17201 students, aged 6-15 years, were screened, and the overall prevalence of CD was 1 in 184 subjects, with a ratio of 1 in 7 of known to unknown CD cases.

In Spain, another mediterranean country, a prevalence of 1/389 was found in a general population of the northern province of Asturias (year 2000) (5).

More to the west, in Portugal, in 2002, in the town of Braga the prevalence of CD in 536 adolescents was 1 in 134 (6).

Moving more to the north, in Germany, in 2001, in the Dresden region, the number of CD confirmed as always by biopsy indicated a prevalence of mainly asymptomatic CD of 1 in 500 children (5-12 years) and 1 in 540 adults (blood donors) (7). These results, compared with a previous study on the prevalence of clinically typical CD in the same area, indicate a four-fold higher prevalence of asymptomatic CD.

In Switzerland (1999 to 2000), in the St-Gallen area, CD occurred in 1 in 132 adolescents, ten times more frequent than figures published 20 years ago from the same region (8).

In France, recent data (2000-2001), shows a prevalence among adults ranging from 1 in 388 to 1 in 643, most cases being, as elsewhere, atypical or subclinical (9,10).

In the Netherlands, among apparently 1000 healthy blood donors the prevalence of CD is 1/333 similar to blood donors in Denmark (1/394), Sweden (1/373) and Norway (1/340), all recent studies (1997-2000) (11,12, 13).

In Finland, in 1997, a prevalence of 1/130 is found among 1070 adults working at the Helsinki university central hospital (14).

These scandinavian figures refute a quite recent idea that there are regional differences in CD in Scandinavia (15), mainly between Sweden and Denmark.

In the British isles epidemiological studies were conducted since 1980.

Recent data, 1997, indicate a prevalence in Northern Ireland (Belfast) of 1/122, showing that CD is more prevalent than previous estimation (16).

There is no recent data in Scotland, but from 1960 to 1979 there was a threefold increase in the incidence of

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cases of CD in adults (17). A case finding study in primary care in the Oxford area showed in 1999 a prevalence of CD to be 1/333 also showing that general practitioners as well have an important role in the identification of patients with CD (18). A study from south Glamorgan conducted between 1981 and 1995 emphasizes that incidence rates have risen (in adults) from 1.32 to 3.08 per 100000, and almost 50% of adults were over fifty years old when diagnosed (19).

In the two most recent studies, both published as abstracts in 2002, one in Wales among 1000 young health care workers and one in Cambridge among 7550 persons aged 45-74 years the prevalence of CD was 1/166 and 1/100 respectively (20,21).

In conclusion, CD in Europe has a prevalence ranging from 1/100 to 1/500 with a disease declining in childhood and is presenting or detected at a later age.

#### *CD in northern and southern America*

In the USA, about ten years ago, CD was considered to be relatively rare (22). Recent data shows that the disease is as frequent as in Europe.

In a study done in 1998 among 2000 healthy blood donors, 8 had CD, thus indicating a prevalence (1/250) similar to screening studies performed in Europe (23).

In another study (1999) done in 1200 individuals aged 6 months to 20 years, presenting with symptoms or conditions associated with CD, the prevalence of CD confirmed by biopsy was 1/57, and if all patients with positive endomysium antibodies who refused biopsies were included the prevalence of CD in this clinical selected study could be as high as 1 in 33 (24).

In the most recent study (2002) done in an outpatient clinic in Alabama, a prevalence of 1/259 was found (25).

In Brazil among 2045 blood donors a prevalence of undiagnosed CD of 1/681 was found, but as the majority were males (CD is more common in females (3)), the initial screening was done by antigliadin antibodies (endomysium antibodies are more sensitive (3)), and patients with low hematocrit were excluded, the actual prevalence of CD may well be higher (study done in 2000) (26).

In Argentina, in 2001, the prevalence of CD among 1000 couples attending a centralized laboratory for an obligatory pre-nuptial examination, was as high as 1/167 (27).

#### *CD in the rest of the world*

In western Australia, a retrospective analysis of stored serum samples from 3011 random subjects, showed a prevalence of 1 in 251 with a significant clustering of cases in the 30-50 years age range (study done in 2000) (28).

In New Zealand, the prevalence of CD in adult population of Christchurch (year 1996) is 1,2% (29) curiously largely superior to figures in the Wellington area (1985 to 1992) where overall incidence was 1,8 per

100000 with an estimated overall prevalence of 70 per 100000 (0,07%). Only 11% of the total were children (30).

In India there are no studies of prevalence, but the incidence is increasing by 15 cases a year in the area of Ludhiana, when a retrospective analysis is done of confirmed cases of CD between 1995 and 2000 (31).

In Jordan (1996) the incidence was calculated to be 1/2800 live births inferior figures compared to Israel (1984), 1,71/1000 live births (32,33).

CD is extremely frequent among Saharawi population (Sahara – in western Africa), 1/20 in children (34). However, the distribution of DQ genes of saharawis is similar to that of Italians (Sardinians), population with a lower prevalence of CD, thus implicating that DQ genes in Saharawis provides only a partial explanation for the high prevalence of CD (35).

#### *Studies in mixed populations*

A study done in the area of Leicester, UK, measured the incidence of CD in different ethnic communities (European and Indian). The overall incidence of CD in Europeans was 2,5/100000/year, in Gujaratis (Hindus and Muslims) 0,9/100000/year and in Punjabis (sikhs, hindus, muslims) 6,9/100000/year. These differences were independent of religious belief. The incidence in the urban population was twice as high than that at rural areas (6 and 3,2/100000/year) (study done in 1992) (36).

In Israel the highest incidence was in children of Asian origin and the lowest in second generation Israel born (33).

#### *Prevalence of CD detected at endoscopy*

A number of changes in the duodenum are sometimes associated with CD and could be identified by endoscopy (loss of folds, scalloping, mosaic pattern, visualisation of underlying blood vessels) (37).

Unsuspected clinical CD was diagnosed at endoscopy in 9 patients among 1749 patients undergoing endoscopy in New York (1999) thus a prevalence of 1 per 194 endoscopies. None of the patient had diarrhea or suspected malabsorption (38).

In Greece a similar study (2000) found 1 new case of unsuspected CD per 520 endoscopies (39).

However, a recent study from Rochester (2002), found that the sensitivity of endoscopic markers was quite low (50%) compared to previous publications (40).

## **Discussion**

The prevalence of CD is increasing worldwide (1,3,7,8,17,25,31). It is possible, that the facility to screen the disease by serological means can explain a part of this increase, as more silent or subclinical cases are detected (1,3,4). In some series only about 10% to 20% of cases had the "classical" form of CD (1,3,7,9,10). Screening by antigliadin and endomysium antibodies can detect

almost all cases of CD, endomysium antibodies being more sensitive in patients with no IGA deficiency (1,3). Some studies (4,5,26) used only anti gliadin antibodies, thus missing perhaps 5% to 10% of CD cases (1,3).

As mentioned earlier the search for CD among blood donors can give an underestimation of the prevalence of the disease. Potential donors are usually excluded if they have a low hematocrit (a possible complication of CD) or hypertransaminasemia (a possible association with CD) (3).

A part from a small area in Africa (Saharawi population (34)), the highest prevalence of CD is found in the British isles (1%) (21).

Scandinavia and USA have a similar prevalence (0,3%-0,4%) and elsewhere in the world the prevalence varies from 0,3% to 0,1% (12,23,26,27).

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