Supplementary Table 1. Laboratory tests and methods. Laboratory tests are on the left column and used methods with commercial kits (when available) are listed on the right column. HUSLAB= Hospital District of Helsinki and Uusimaa Laboratory (in Helsinki University Central Hospital, Helsinki, Finland).

Test	**Method (Commercial kit)**
Serum B12 and/or B12-TC2	Chemiluscent Microparticle Immunoassay (Abbott AxSYM ja Abbott Architect, AbbottAbbott, IL, USA)
Fecal calprotectin	ELISA (CALPRO Calprotectin ELISA Test; CALPRO AS, Norway)
Fecal α1-antitrypsin	ELISA (Immundiagnostik, Germany)
Fecal salmonella, shigella, campylobacter, *Yersinia enterocolitica/pseudotuberculosis*, *Clostridium difficile*	Fecal bacterial culture, HUSLAB, Finland
Fecal *Clostridium Difficile* Toxin	Enzyme immunoassay (Premier Toxins A&B-test kit (Meridian; Bioscience Inc., Cincinnati, OH, USA) during 2007–2010 and with VIDAS C. difficile Toxin A & B CDAB-system (bioMerieux, Marcy l'Etoile, France) from 2011 onwards)
Fecal salmonella, shigella, campylobacter, *Yersinia enterocolitica/pseudotuberculosis*, *Escherichia coli* including its enteroaggregative (EAEC), enteroinvasive (EIEC), enterotoxic (ETEC), enterohemorrhagic (EHEC), and enteropathogenic (EPEC) strains and *Vibrio cholerae*	Fecal bacterial culture and PCR for nucleic acids of bacteria, HUSLAB, Finland
Fecal antigen of *Helicobacter pylori*	Enzyme immunoassay (Premier Platinum HpSA PLUS; Meridian Biosciences, USA Premier Platinum HpSA PLUS; Meridian Biosciences, USA)
Fecal antigen of rotavirus and adenovirus	Immunochromatography (Diarlex® MB_; Orion Diagnostica, Finland and RIDA®QUICK Rotavirus/ Adenovirus Combi; Mediq, Germany)
Fecal antigen of *Giardia lamblia* and cryptosporidium	Enzyme immunoassay (ProSpecT^{TM} Giardia/Cryptosporidium REMEL/Thermo Fisher Scientific, USA)

Fecal *Giardia Lamblia* and Cryptosporidium	Microscopic examinations after standard formalin-ethylacetate-concentration of fecal sample, HUSLAB, Finland

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CVID	Euroclass	Antrum	Corpus	Helicobacter pylori	OLGA Stage
Probable	B+smB-21norm	I 1/3, A 1/3, IM 0/3	I 2/3, A 3/3, IM 2/3	No	III
Probable	B+smB-21loTrnorm	I 0/3, A 0/3, IM 0/3	I 2/3, A 3/3, IM 0/3	No	II
Probable	B+smB-21loTrnorm	I 0/3, A 0/3, IM 0/3	I 2/3, A 3/3, IM 2/3	Yes	II
Probable	B+smB-21loTrnorm	I 0/3, A 0/3, IM 0/3	I 2/3, A 3/3, IM 3/3	No	II
Probable	B+smB-21loTrnorm	I 0/3, A 0/3, IM 0/3	I 1/3, A 1/3, IM 0/3	No	I
Probable	B+smB-21loTrnorm	I 2/3, A 1/3, IM 0/3	I 3/3, A 2/3, IM 0/3	No	II
Probable	B+smB-21loTrnorm	N.A.,only cancer biopsies	N.A. only cancer biopsies	No	Gastric cancer
Probable	N.A.	I 0/3, A 3/3, IM 2/3	I 1/3, A 3/3, IM 3/3	No	IV, Gastric cancer
Probable	B+smB-21loTrnorm	I 0/3, A 0/3, IM 0/3	I 1/3, A 3/3, IM 1/3	No	II
Probable	B+smB-21loTrnorm	I 0/3, A 0/3, IM 0/3	I 2/3, A 2/3, IM 0/3	Yes	II
Probable	B+smB-21norm	I 0/3, A 0/3, IM 0/3	I 2/3, A 3/3, IM 0/3	No	II
Probable	B+smB-21loTrnorm	I 1/3, A 3/3, IM 3/3	I 2/3, A 2/3, IM 2/3	No	IV
Possible	B+smB-21norm	I 1/3, A 0/3, IM 0/3	I 1/3, A 2/3, IM 0/3	No	II

Supplementary Table 2a. Histological samples of CVID patients with atrophic gastritis patients (above) were reanalyzed by expert GI pathologist and graded according to Operative Link to Gastritis Assessment (OLGA) classification (Rugge M et al. Gut. 2007;56:631–36). I=inflammation, A=atrophy, IM=intestinal metaplasia. N.A.=not available, from other hospital district. For B-cell phenotypes, the following abbreviations were used: B^- =$CD19^+$ B cells ≤1% of lymphocytes, smB^- = switched memory B cells ≤2% of B cells, 21^{low}= $CD21^{low}$ cells ≥10% of B cells.

CVID	Euroclass	Corazza--Villanacci classification	Paucity of plasma cells	tTG-Ab	EM Ab	GFD response	HLA DQ2 / DQ8	Ig treatment	Chronic norovirus
Probable	B+smB-21loTrnorm	Grade B2	-	No	No	No	N.A.	Yes	No
Probable	B+smB-21loTrnorm	Grade B1	+	No	No	Yes	No	Yes	No
Probable	B+smB-21loTrnorm	N.A.	N.A.	No	No	No	DQ2	Yes	No
Possible	B+smB+21normTrnorm	Grade A	-	Yes	N.A.	Yes	DQ2	Yes	No
Probable	B-	Grade B1	+	No	No	No	DQ8	Yes	Yes
Probable	B-	Grade B1	-	No	Yes	No	DQ2	Yes	Yes
Probable	B+smB-21loTrnorm	N.A.	N.A.	N.A.	N.A.	Yes	N.A.	No	No
Probable	B+smB-21loTrnorm	Grade B1	-	No	No	Yes	N.A.	Yes	No

Supplementary Table 2B. Histological samples of CVID patients with atrophic gastritis patients (above) were reanalyzed by expert GI pathologist and graded according to Corazza-Villanacci classification (Corazza GR et al. J Clin Pathol. 2005;58:573–4).tTG-Ab=tissue transglutaminase antibodies, EM Ab= endomysium antibodies, Ig=Immunoglobulin. N.A.=Not available. N.D.=Not detected. Two patients had been diagnosed earlier in another hospital district and original histology samples were not obtained for classification. Among all CVID patients, celiac disease autoantibodies were measured to some extent including tissue transglutaminase (IgA 58%, IgG 54%) and endomycium (47%). However, among all of these patients only two had celiac disease autoantibodies: one with possible CVID had clearly elevated tTG IgG antibodies and the other had just above detection level of EM IgG during gammaglobulin supplementation. For B-cell phenotypes, the following abbreviations were used: B^- =$CD19^+$ B cells ≤1% of lymphocytes, smB^- = switched memory B cells ≤2% of B cells, 21^{low}= $CD21^{low}$ cells ≥10% of B cells.