



LEVELS OF FECAL CALPROTECTIN IN GLUTEN-RELATED DISORDERS IN PEDIATRIC PATIENTS IN A CHILDREN'S NUTRITION, HEPATOLOGY AND GASTROENTEROLOGY CENTER OF COLOMBIA (GASTRONUTRIPED)

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Objectives and study: Gluten-Related Disorders (GRD) includes: wheat allergy (WA), celiac disease (CD) and non celiac gluten sensitivity (NCGS). The immune response against gluten and inflammation are common to these three entities. Increased fecal calprotectin (FC) concentration, as an inflammatory intestinal marker, could be useful for the diagnosis and monitoring of inflammation in these disorders. The main aim of this study was to determine levels of FC in pediatric patients with gluten-related disorders in a pediatric nutrition, hepatology and gastroenterology center in Bogotá (Colombia), between January 2012 and February 2018.

Methodology: Retrospective descriptive study. Patients of both genders were included, between 6 months to 15 years of age, with appropriate diagnosis of any gluten-related disorders (WA, CD, NCGS). The diagnostic tests were: anti-transglutaminase antibodies (tTG), anti-gliadin antibodies (AGA), HLA-DQ2/DQ8, intestinal biopsy (Marsh classification, counting of eosinophils), specific immunoglobulin E (immunoCAP) and skin prick test (SPT). The diagnosis of NCGS was made following international directions (discarding the other two entities and applying a questionnaire assessing baseline intestinal and extraintestinal symptoms in two periods, on a gluten-free diet and with gluten's challenge). FC values were classified according to NICE Guideline: negative (<50 µg/g), mild (50-100 µg/g), moderate (101-200 µg/g) and severe (>200 µg/g). The data were analyzed with Stata 13. For the categorical variables, absolute and relative frequencies were used and, for the continuous, measures of central tendency and dispersion.

Results: For a total of 37 patients, 67% (n=25) with WA, 19% (n=7) with CD and 14% (n=5) with NCGS. Of the 25 with WA, 60% (n=15) were male, 4.8 years average for age; the most common symptoms of consultation were: abdominal pain (84%), diarrhea (80%), abdominal distension (72%). The specific IgE was positive in 56%, SPT positive in 16%, 28% had >20 eosinophils HPF in the intestinal biopsy. In CD patients, male gender prevailed (57%) and the mean age was 2.7 years, 88% had diarrhea and bloating, 76% abdominal distension; the mean of tTG IgA antibody was 42.2 U/ml and tTG IgG of 14.83 U/ml, 100% presented Marsh classification ranged from 2 to 3. Of the patients with NCGS, female gender predominated (80%), with a mean age of 3.6 years, 100% presented abdominal distension, 80% constipation; 40% tTG IgG positive, 60% HLA-DQ2 positive, 20% HLA-DQ8 positive, 40% Marsh 1. FC was made in 51% of patients with GRD. In WA patients, 6/11 were positive with average of 212.0 µg/g. In CD patients, 2/3 were positive with average of 231 µg/g. All patients with NCSG had FC, 80% (4/5) was positive with average of 184.7 µg/g.

Figure 1 Distribution of patients with Gluten-Related Disorders in Gastronutriped, 2012-2018

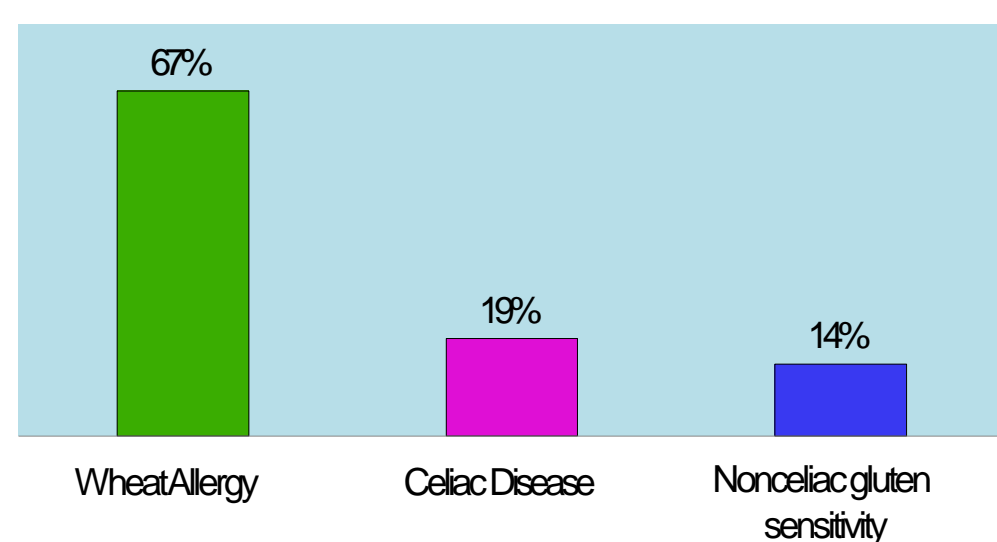


Figure 2 Distribution of gender in patients with Gluten-Related Disorders in Gastronutriped, 2012-2018

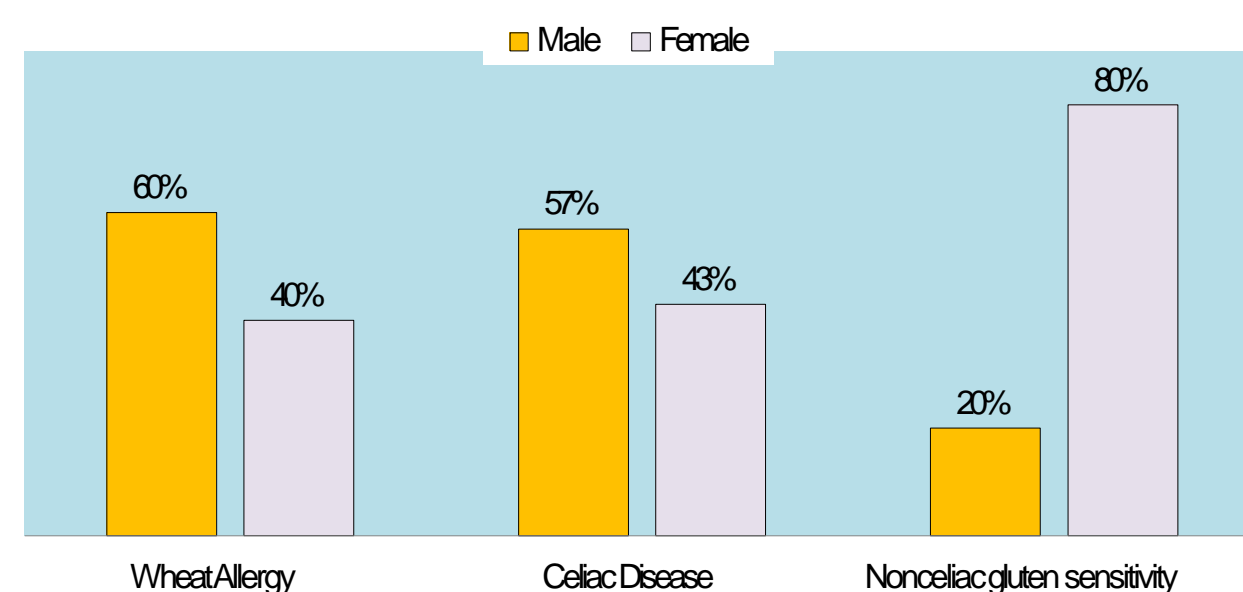


Figure 3 Distribution of main symptoms in patients with Gluten-Related Disorders in Gastronutriped, 2012-2018

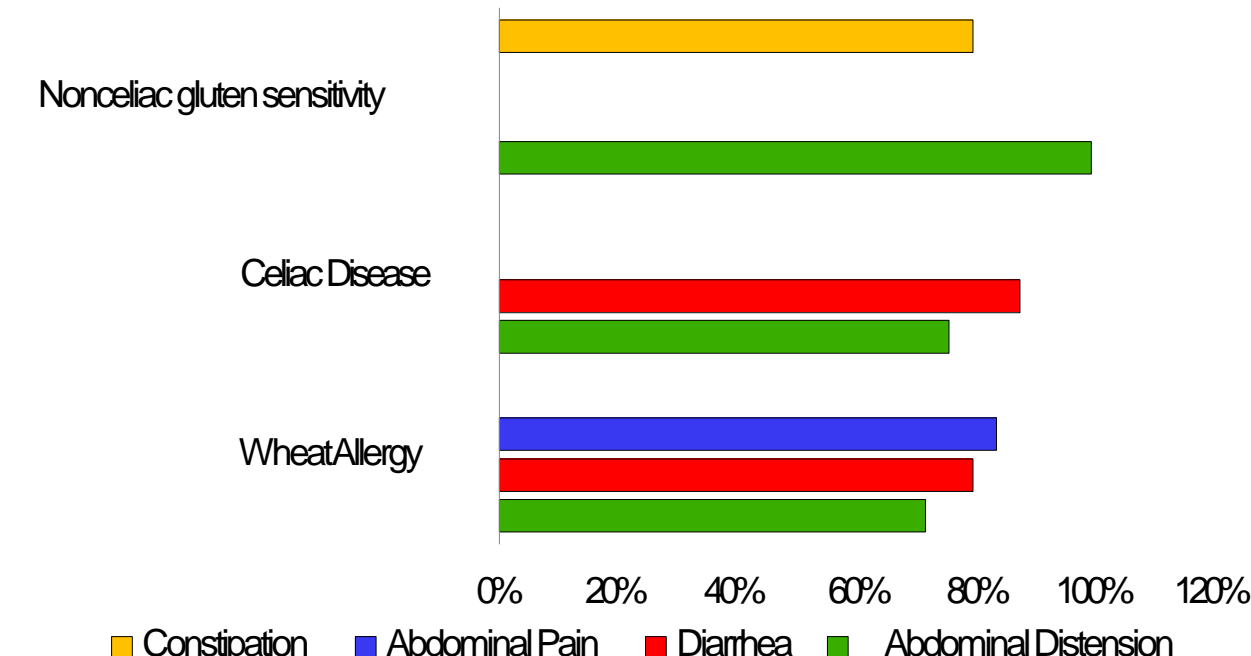


Figure 4 Mean of age (years) in patients with Gluten-Related Disorders in Gastronutriped, 2012-2018

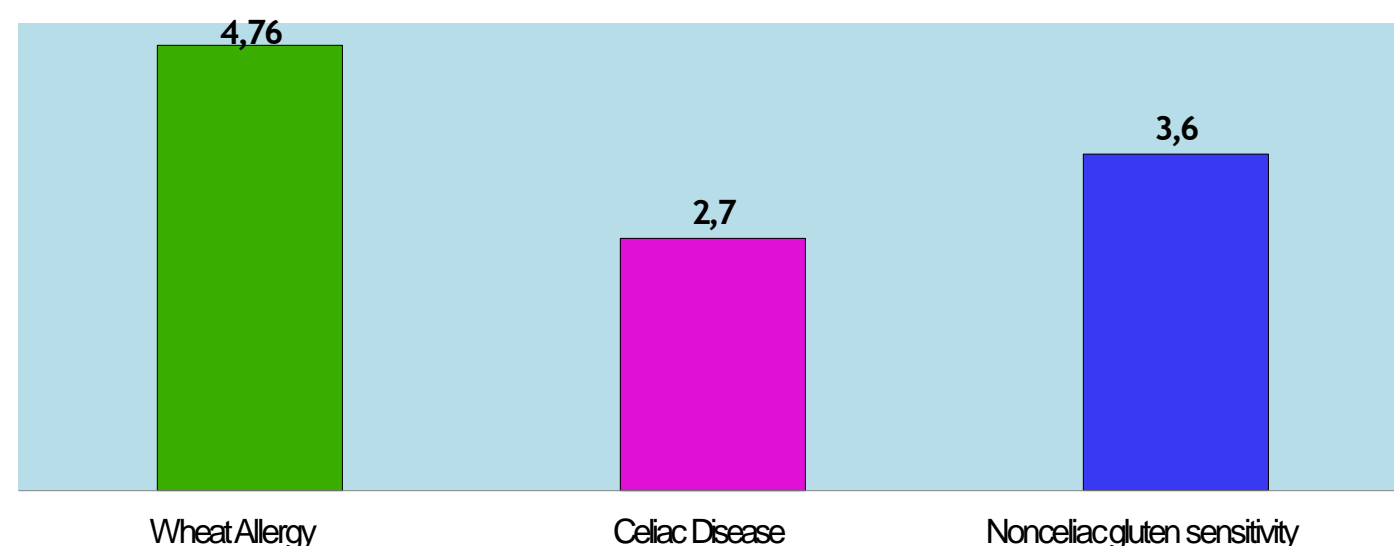
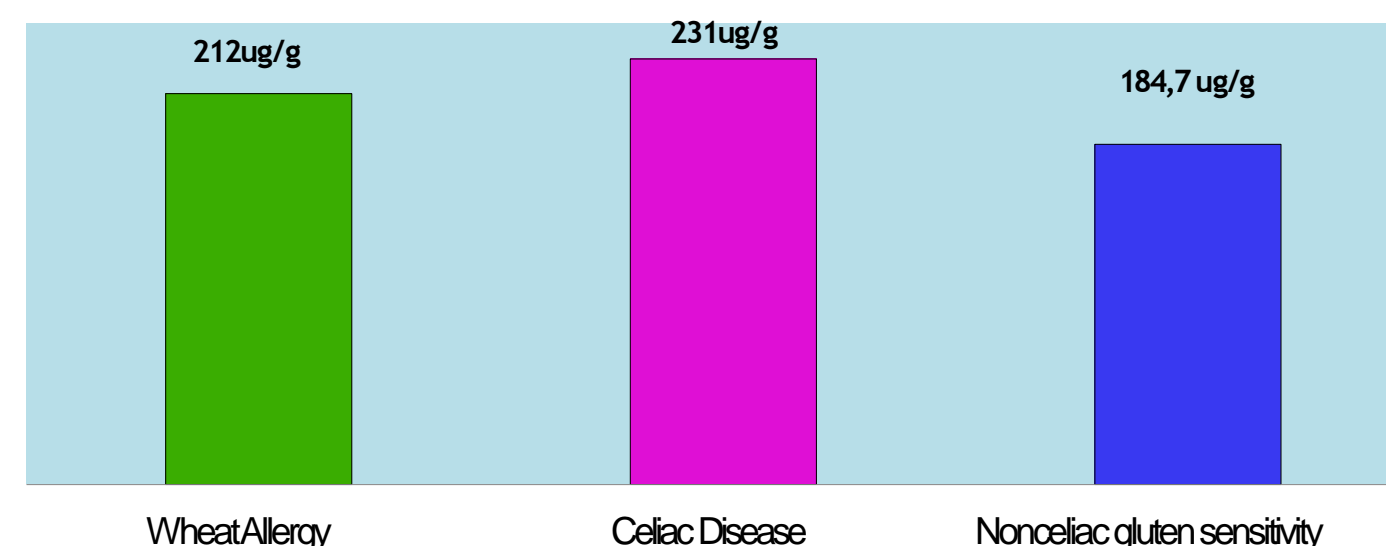


Figure 5 Mean Fecal Calprotectin Positive in patients with Gluten-Related Disorders in Gastronutriped, 2012-2018



Conclusion: These three GRD have some gastrointestinal symptoms in common. Also, all of them have high FC levels, which demonstrate inflammation at diagnosis time, but do not guide in the differentiation between these entities; even though the inflammation was higher in WA and CD than in NCGS. Multicenter studies including other parameters such as cytokines could guide differentiation between these disorders.

Conflict of interest statement: The authors have no conflicts of interest, financial or otherwise, to report with respect to this study.



BIOCHEMICAL PARAMETERS ACCORDING TO AGE AND SEVERITY OF EXCESS WEIGHT IN A PEDIATRIC NUTRITION HEPATOLOGY AND GASTROENTEROLOGY CENTER (GASTRONUTRIPED) IN COLOMBIA



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Objectives: Excess weight impacts negatively different systems and generates early complications in adult life. Biochemical markers are useful for early detection of some complications. The main aim of the study was to compare biochemical parameters in overweight (Ow) and obese (Ob) patients, according to age group, in a pediatric nutrition, hepatology and gastroenterology center (Gastronutriped) in Bogota (Colombia), between January, 2009 and June, 2015.

Methods: Descriptive retrospective study. Clinical records and the data base were reviewed for all patients with weight's excess. Basal serum insulin, glycemia, HOMAIR, thyroid profile, lipid profile, hepatic and hematological markers values were recorded. The statistical analysis included univariate and bivariate analysis with a CI of 95%, and the Mann-Whitney U test for comparison of the groups.

Results: 222 patients had excess of weight, with ages from 1 to 223 months, 53.1% were female. Obesity was most frequent in adolescents (43,6%) and school-age (33%). Overweight was more relevant in infants (32,8%) followed by adolescents (27,3%) (Table 1). The average values of biochemical parameters were higher in adolescents than in others groups. The average values in adolescents were: glycemia (117 mg/dl), total cholesterol (198 mg/dl), LDL (115.4 mg/dl), HDL (49.6 mg/dl) and HOMAIR (3.8). There were no statistically significant differences in biochemical parameters values by gender (Table 2). On the other hand, to compare biochemical parameters in obese vs. overweight patients, we found greater average values of glycemia (Ob: 113.4 mg/dl vs. Ow: 88 mg/dl), insulin (Ob: 16.9 mg/dl vs. Ow: 13 mg/dl), HOMAIR (Ob: 3.7 vs. Ow: 1.9) hepatic markers (AST Ob: 34.4 mg/dl vs. Ow: 26.8 mg/dl; ALT Ob: 32.4 mg/dl vs. Ow: 26.1 mg/dl), and lipid profile (CT Ob: 196 mg/dl vs. Ow: 181.4 mg/dl; LDL Ob: 121.1 mg/dl vs. Ow: 113 mg/dl, HDL Ob: 47.9 mg/dl vs. Ow: 50.3 mg/dl, triglycerides Ob: 120.6 mg/dl vs. Ow: 86.3 mg/dl); although differences were not statistically significant (Table 3 and 4).

Table 1 - Age group's distribution in patients diagnosed with overweight or obesity, Gastronutriped, 2009 - 2015

Age group	Total (n=222) (%≠100)		Overweight (n=128) (%≠100)		Obesity (n=94) (%≠100)	
	n	%	n	%	n	%
Newborns	2	0,9	2	1,6	0	0,0
Infants	58	26,1	42	32,8	16	17,0
Pre-schoolers	36	16,2	30	23,4	6	6,4
School-age	50	22,5	19	14,8	31	33,0
Adolescents	76	34,2	35	27,3	41	43,6

Table 3. Biochemical parameters in patients diagnosed with overweight or obesity, Gastronutriped, Colombia 2009-2015.

Biochemical Parameters	Overweight (n=128)		Obesity (n=94)		p
	n	Median	n	Median	
Glycemia (mg/dl)	25	88,0	31	113,4	0,841
Insulin (mU/ml)	7	13,0	9	16,9	0,568
HOMA-IR	7	1,9	9	3,7	0,401
ALT (UI/L)	20	26,1	30	32,4	0,221
AST (UI/L)	20	26,8	30	34,4	0,234
Total cholesterol (mg/dl)	30	181,4	33	196,0	0,442
LDL (mg/dl)	31	113,0	28	121,1	0,913
HDL (mg/dl)	31	50,3	30	47,9	0,812
Triglycerides (mg/dl)	24	86,3	29	120,6	0,234

Table 2. Biochemical parameters according to gender in patients diagnosed with overweight or obesity, Gastronutriped, Colombia 2009-2015.

Biochemical Parameters	Male (n=104)	Female (n=118)	p
Glycemia (mg/dl)	90,0	111,1	0,741
Insulin (mU/ml)	13,2	17,7	0,368
HOMA-IR	2,1	3,9	0,101
ALT (UI/L)	28,9	30,4	0,721
AST (UI/L)	31,7	31,2	0,434
Total cholesterol (mg/dl)	196,1	183,4	0,480
LDL (mg/dl)	115,0	118,2	0,457
HDL (mg/dl)	50,6	47,9	0,044
Triglycerides (mg/dl)	101,3	107,9	0,149

Table 4. Biochemical parameters according to age's group in patients diagnosed with overweight or obesity, Gastronutriped, Colombia 2009-2015.

Biochemical Parameters	Newborns (n=0)		Infants (n=58)		Pre-schoolers (n=36)		School-age (n=50)		Adolescents (n=76)	
	n	Median	n	Median	n	Median	n	Median	n	Median
Glycemia (mg/dl)	-	-	6	91,7	7	87,6	17	87,7	26	117,9
Insulin (mU/ml)	-	-	-	-	3	6,9	4	8,9	9	20,7
HOMA-IR	-	-	-	-	3	1,3	4	2,1	9	3,8
ALT (UI/L)	-	-	6	33,2	6	28,1	14	32,5	24	27,9
AST (UI/L)	-	-	6	41,3	6	25,5	14	36,1	24	27,6
Total cholesterol (mg/dl)	-	-	7	187,1	10	175,0	18	183,6	28	198,0
LDL (mg/dl)	-	-	7	112,6	10	122,5	16	117,4	26	115,4
HDL (mg/dl)	-	-	7	47,3	10	49,4	16	49,0	28	49,5
Triglycerides (mg/dl)	-	-	5	122,4	11	73,2	11	100,0	26	117,3

Abbreviations: ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, LDL: Low-density lipoprotein, HDL: High-density lipoprotein

Conclusions: Excess of weight has associated with metabolic changes reflected by biochemical parameters such as resistance to insulin, glucose intolerance and dyslipidemia, which seem to increase in parallel with the severity of weight's excess and with age; as was observed in obesity and adolescent groups, respectively. The timely detection of these changes, by means of biochemical parameters, could help preventing the development or, slow down the manifestation of entities such as diabetes, hepatic steatosis or cardiovascular disease.

Conflict of interest statement: The authors have no conflicts of interest, financial or otherwise, to report with respect to this study.