Original Research Article

Distribution of chronic gastropathies and associated factors with the presence of anti-gastric parietal cell antibodies in a Cameroonian population

Abstract

Background and aim: Data on autoimmunity remain rare in Central Africa due to the orientation of most of research program on infectious diseases.For the time being, diagnosis of autoimmune diseases in Cameroon remains very limited. Anti-gastric parietal cell antibodies (AGPCA) lead to destruction of the gastric wall resulting in atrophy. The objective of this study was to determine the prevalence of AGPCA and association with socio-demographic factor in patients with chronic gastropathies**.**

Methodology: This was a cross- sectional study from March to October 2020, in two hospitals in Douala city. The type of gastropathy was determined by fibroscopy and autoantibodies were tested by Indirect Immunofluorescence at Centre Pasteur of Cameroon. The kit used was that of Euroimmum lot F Lot F 211117DB, a Leica DM 1000 fluorescence microscope was used to read the reactions. Data wereanalysed by SPSS 25.0, a P value of 0,05 was consider as significant.

Comment [DS1]: rectify

Results: 120 patients were enrolled composed of 57 (47,5%) men and 63 (52,5) women with 0,9 of sex ratio M/W. The prevalence of AGPCA was 10.8%. The age of the patients positive for anti-gastric parietal cell antibodies ranged from 21 to 87 years (P=0.003), 06 men and 07 women were diagnosed positive P=0.918, OR=1,063(0,335 – 3,371). The most represented type of gastropathy was gastritis with 6 (46,2%)patients (P=0.032). Risk factors such as age, Adjusted Odds Ratio (AOR) 1.414 (0.798 - 2.507) P= 0.236.

Comment [DS2]: rectify

Conclusion:the overall prevalence of ACPG in our study is 10.8%. in bivariate analyses, we found associations between the factors age, occupation and type of gastropathy..Although very often found in elderly subjects, the results obtained in this study are in favour of a more or less homogeneous distribution in the population.

Key words: **anti-gastric parietal cell antibodies, gastropathies, dyspeptic symptoms**

Introduction

It was in 1988 that Karlsson et al demonstrated that the proton pump represents the antigen of anti-gastric parietal cell antibodies (1). They are directed against the proton pump (H+/K+ ATPase) and localized in the secretory canaliculi of gastric parietal cells as well as in gastric microsomes (2). These autoantibodies had a sensitivity of 80-90% and a specificity of about 50%. (3). It was important to remember that there was a physiological threshold for this autoantibody. Hence the need for titration to confirm the presence of this antibody at a high level. This antibody was not specific to autoimmune gastritis and could be found in other autoimmune diseases but at a lower level. In very advanced stages of the disease, there was some decrease in the level of this antibody in the serum of patients. This could be explained by the fact that the gastric mucosa was destroyed by the action of the autoantibodies and had been replaced by a scar-like tissue(4).

In routine practice in medical laboratories, two methods were used for the determination of these antibodies: ELISA and indirect immunofluorescence (5).

The immunofluorescence technique was developed in 1942 and refined in 1950 by Coons, who was able to read specific reactions on tissues and cell preparations. In 1963 a link was made between lupus erythematosus lesions and a deposition of IgG and C3 complex on the dermal-epithelial junction. In 1964 Beutner and Jordon used indirect immunofluorescence to identify autoantibodies involved in the development of pemphigus (6).

It was a sensitive, fast, responsive technique that could be automated for routine use (7). The performance of immunofluorescence techniques therefore combines the sensitivity of fluorescence and the specificity of antibodies to their antigens.

The relatively long duration of dyspeptic symptoms, the repetition of these symptoms, and the influence of social factors led us to believe that the risk of developing atrophic gastritis by producing AGPCAs was high. We believe that age, gender and even occupation may be factors leading to the development of AGPCA.

The objective of this study was to determine the prevalence of AGPCA and to find different associations between socio-demographic factors and endoscopic findings.

Materials and methods

Study design

It was a cross-sectional study with patients recruited in two hospital of Douala city and samples analysed at the Centre Pasteur of Cameroon in Yaoundé from March to October 2020.

Was eligible for this study patients with record file in the gastroenterology unit, had a chronic gastropathy for at least 5 years, perform an endoscopy test. It was ban for patients asking for payment, having another autoimmune disease as Hashimoto thyroid, person who refuse to participate to the study.

Comment [DS3]: change sentence formation

Aquestionnaire was used to collect the socio-demographic data of the participants meeting the inclusion criteria. For each patient, after explanation of the project and informed consent.Ethical considerations were respected.

Endoscopy and sample analysis

An endoscopy was performed for each patient to determine the gastropathy.

We took a dry blood sample for autoantibody testing. After the serum separated into an Eppendorff tube, then frozen at -20°C.

The kit used for diagnosis was Euroimmun Kit Lot F 211117DB. it allows the qualitative or semi-quantitative in vitro determination of human IgG immunoglobulin class antibodies against parietal cells. The reaction was read under a fluorescence microscope.

Excitation filter: 450-490 nm, colour separator: 510 nm, blocking filter: 515 nm Light source: Mercury vapour lamp, 100 W

Statistical analysis

Data were entered with Excel 2019 and analysed with SPSS software version 25.0. The results of the descriptive analyses will be presented as frequencies. The chi-square test was used to assess the independence of the presence of ACPG and socio-demographic and clinical characteristics. The bivariate analyses provided odds ratios with a 95% confidence interval. A P value < 0.05 was considered a significant association between two variables.The mutilivariate analysis was performed by logistic regression between gastric parietal cell antibody positivity and the identified risk factors.

Results

120 patients were recruited for this study. 47.5% were male and 52.5% were female, with a sex M/W ratio of 0.9. The age of the patients ranged from 19 to 87 years. Workers were most represented in the socio-professional category 64.2%. AGPCA were found in 13 patients, i.e. 10.8%. Table I shows these results.

Table I: socio-demographic data of patients

Variable		N(%)
sex	Male	57 (47,5)
	Female	63 (52,5)
Age (years)	[19 - 28]	15 (12,5)
	[29 - 38]	19 (15,8)
	[39 - 48]	25 (20,8)
	[49 - 58]	21 (17,5)
	[59 - 68]	29 (24,2)
	[69 - 78]	6 (5,0)
	[79 - 88]	5 (4,2)
Occupation	Student	5 (4,2)
	Worker	77 (64,2)
	Civil servant	15 (12,5)
	Pensioner	23 (19,2)

Comment [DS4]: correctdecimal point

Table II :Positivity to AGPCA according to socio-demographic data.

Variables		Presence of AGPCA					
		Positive	Négative	Chi 2	OR	CI	P value

		N(%)	N(%)			(95%)	
Sex	Male	6 (5)	51 (42,5)	0,011	1,063	0,335 – 3,371	0,918
	Female	7 (5,8)	56 (46,7)				
Age (years)	[19 - 28]	2 (1,7)	13 (10,8)	19,602	-	-	0,003
	[29 - 38]	2 (1,7)	17 (14,2)				
	[39 - 48]	-	25 (20,8)				
	[49 - 58]	1 (0,8)	20 (16,7)				
	[59 - 68]	3 (2,5)	26 (21,7)				
	[69 - 78]	2 (1,7)	4 (3,3)				
	[79 - 88]	3 (2,5)	2 (1,7)				
Occupation	Student	1 (7,7)	4 (3,7)	8,535	-	-	0,036
	Worker	6 (46,2)	71 (66,4)				
	Civil servant	0 (0,0)	15 (14,0)				
	Pensioner	6 (46,2)	17 (15,9)				

Analysis of the data in Table II yielded two variables with significant P values. Age was a factor associated with the presence of AGPCA P = 0.003 as was the occupation of the participants P = 0.036.

Table III : positivity of AGPCA according to according to endoscopy results

Variables		Presence of AGPCA			
		Positive N(%)	Négative N(%)	Chi 2	P value

Type of gastropaty(endoscopy)	Normal examination	-	10 (9,3)	13,797	0,032
	Gastritis of the fundus	2 (15,4)	13 (12,1)		
	Gastritis	6 (46,2)	24 (22,4)		
	Antralgastritis	1 (7,7)	23 (21,5)		
	Erosiveantralgastritis	2 (15,4)	21 (19,6)		
	Atrophicgastritis	1 (7,7)	-		
	Antralulcer	1 (7,7)	16 (15,0)		

The association between fibroscopy findings and the presence of AGPCAs summarised in Table III shows various types of gastropathy with a significant P value of 0.032.

Table IV :risk factor and multivariate logistic regression model.

	P value	AOR	CI (95%)	
Age	0,236	1,414	0,798	2,507

Men	0,918	0,928	0,223	3,865
Women	-	-	-	-
Occupation	0,505	-	-	-
Student	0,254	0,191	0,011	3,279
Worker	0,998	0,000	0,000	.
Civil servant	0,629	0,403	0,010	16,181
Pensioner	-	-	-	-
Type of gastroscopy	0,670	-	-	-
Normalexamination	0,999	2989,004	0,000	.
Gastritis of the fundus	0,999	48199,882	0,000	.
Gastritis	0,999	8806,121	0,000	.
Antralgastritis	0,999	1588,813	0,000	.
Erosiveantralgastritis	0,999	10877,000	0,000	.
Atrophicgastritis	0,999	7986,821	0,000	.
Antralulcer	-	-	-	-

The results of the multivariate analysis contained in Table IV show that when all the risk factors are taken together, the association between these factors and the presence of AGPCA is no longer found.

Discussion

After analysis, we obtained 13 positive cases out of the 120 we analysed. The prevalence of this autoantibody in our study population is 10.8%. This prevalence is far from the one obtained by Mejri et al in Tunisia which was 62.5% and 80.3% in the study conducted in Tunisia by Kechida et al on a population of 66 patients(9). The prevalence

reported by Koulidiati et al in Burkina Faso was 71% in 2014(10). This result presented by Mejri et al has similarities with that of Loukili et al in Strasbourg, France, which also shows a prevalence of 62%. (11). It is important to note that the study population of those authors was patients with megaloblastic anaemia.The presence of that autoantibody can lead to the destruction of the gastric mucosaother autoimmune disease.The large difference between these prevalence can be explained by the method of patient selection. In these studies, the patients were those who already had megaloblastic anaemia.

The cross-tabulation of the age variable with AGPCA positivity shows that almost all age groups are affected. In this study, patients with an age range of [39-48] years did not present positive cases. We can also see that the age groups [79 - 88] and [59 - 68] years are the modal classes with 03 patients each. Loukili et al presents in his study five (05) patients and the characteristics of these patients; 02 of the patients are over 80 years old as in our study too, 01 is over 70 years old, 01 is over 65 years old and 01 is 40 years old (11).This distribution of patients according to age clearly shows that this pathology can affect all age groups. We note, however, that the proportion of patients over 70 years of age is greater. We can say that risk of appearance of AGPCA increase with age.The P-value of this cross-over gives us 0.003. This value is significant. The particularity of this study is that different age groups are concerned by this autoantibody.

The relationship between AGPC positivity and gender allows us to observe that of the 13 positive cases, 06 are male and 07 are female. We note that there is no marked difference between the number of positive patients. On the other hand, Seynabou et al report in 2016 a more accentuated representation of women compared to men(12). This result are not different from the one presented by Koulidiati et al ; 07 women for 01 man(10). Our results are similar from those presented by Maazoun et al working on 31 patients at the University Hospital of Sfax in Tunisia. They present a participation of 17 men against 14 women (13). The P value is 0.918, which is not significant, OR = 1,063 that means men and women have de same change to be positive to AGPCA. The comparative study shows a high prevalence among women, especially those over 60. The difference in participation between the two sexes was not very marked in our study. We found almost equal attendance of both sexes in the gastroenterology departments.

The distribution of occupations according to GCPA positivity shows two categories most affected are pensioners and workers with 06 patients in each category. The P value is

0.036, which is significant. Retired people are former workers, and stressful situations in the professional and even family environment have certainly contributed to the development of the action of these autoantibodies . this variable can be link to the age of patient. Retired people have more than 60 years.

The distribution of AGPCA-positive patients according to the type of gastropathy does not show a major predominance of one type of gastropathy. However, research on the type of gastritis according to the presence of AGPCA shows a predominance of atrophic gastritis most often associated with ulcerative lesions(13). Of the 31 patients included in his research, 15 had atrophic gastritis. Similarly, Mejri et al found a prevalence of 62.5% of patients with atrophic gastritis and anti-gastric parietal cell antibodies simultaneously. We obtained a P value of 0. 0,032 which show a significant association between the presence of AGPCA and a particular type of gastropathy. Of the 120 patients we recruited one (01) showed atrophic gastritis as a fibroscopic finding. It was also shown that anti-gastric parietal cell antibodies can be found in both atrophic and non-atrophic gastritis(15).The action of AGPCAs changes with the duration of dyspeptic symptoms. The lack of pathological analysis does not allow us to conclude on the presence of atrophic gastritis. The only case identified had advanced atrophy.

The multivariate analysis allowed us to understand that risk factors were only of interest when they were presented individually, especially in bivariate analyses with significant P values.

One of the limitations of this study is that gastric biopsies were not analysed in order to provide a more accurate prevalence of gastric atrophy caused by the action of AGPCA on the digestive mucosa.

Conclusion

This study provided a prevalence of AGPCA of 10.8% in the Cameroonian population. Factors such as age, occupation and type of gastropathy showed an association with the presence of this autoantibody when taken individually. Although this autoantibody can be found in type I diabetes or Hashimoto's thyroiditis, in the case of gastritis, gastric biopsy remains essential to have the link between the presence of AGPCA and gastric atrophy. this study provides a summary description of this autoantibody for the gastropathy population

Ethics approval and consent to participate

We declare on our honour that the data collection in this study was carried out with full respect for the rights of the patients. The project was clearly explained and the informed consent of the patients was obtained before the collection of the data. We declare that the Helsinki guidelines were followed in their entirety for each patient. Ethical clearances were issued to frame this study.Minors were not included in this study. The following ethical clearances were obtained:

Ethical clearance N° 2020/0043/HGOPED/DG/CEI from the institutional ethics committee of the Gynaeco-Obstetric and Paediatric Hospital of Douala.

Ethics clearance N° 2020/020118/CEIRSH/ESS/MBC of the School of Health Sciences of the Catholic University of Central Africa.

Consent to publication

Not applicable

Availability of Data and Material (ADM)

The data used for this research is available and will be shared with any author who wishes to have it.

List of abbreviations

AGPCA: ANTI-GASTRIC PARIETAL CELL ANTIBODIES

AOR: Ajusted Odds Ratio

OR: Odds Ratio

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