Original Research Article

Factors associated with gastritis in adolescents aged 10 to 17 years at Matanda Hospital in the Democratic Republic of Congo

ABSTRACT

This study, conducted at Matanda Hospital from 1 January to 31 September 2021, focused on the factors associated with gastritis in adolescents aged 10 to 17 years, with a view to contributing to the promotion and improvement of adolescents's health. The objectives of the study were to identify the determinants of gastritis in children aged 10-17 years at Matanda Hospital and to determine the difference in the distribution of these factors among cases and their controls.

The study involved 180 children divided into 90 cases of adolescents with gastritis and 90 control adolescents without gastritis. We thus opted for a case-control study to compare the frequency of exposure to a risk factor in gastritic and non-gastritic adolescents. To carry out these investigations, we used the interview and observation guide as data collection tools; data analysis was done with Epi-Info software using the Odds Ratio to measure the association between gastritis and the different risk factors.

Of the individual factors, only self-medication (OR=6.66) was associated with gastritis. In addition, history of alcoholism with OR=1.47; history of smoking (OR=1.19); psychological stress (OR=2.04); NSAID abuse with OR=1.48, are all behavioural factors associated with gastritis in children. Of all the nutritional factors, the following were retained as risk factors for gastritis in children: irregular mealtimes (OR=1.5); poor food hygiene (OR=1.7); poor chewing ability (OR=1.73).

Keywords: Associated factors, Gastritis, Matanda Hospital

1. INTRODUCTION

Helicobacter pylori is a Gram-negative bacterium whose primary reservoir is the human stomach, and which belongs to the campylobacter family but differs in specific morphological, biochemical and enzymatic characteristics [1]. *Helicobacter pylori* infection is one of the most common chronic infections worldwide, affecting about one third of the population in developed countries and more than two thirds in developing countries, including Morocco [2].

In teenagers, these manifestations are limited to chronic gastritis, often asymptomatic, and rarely to duodenal and sometimes gastric ulcers. This manifestation may evolve with time and depending on other factors (bacterial and host factors) into carcinogenesis (gastric cancer and malt lymphoma), the latter two occurring only in adulthood [3].

Gastritis is a condition that is often overlooked and ignored in children [4]. *Helicobacter pylori* is, according to Lachaux, a very common bacterium found in 50% of humans and affects half of the world's population, mainly in developing countries where the infection reaches 80% of the population [5].

In 2000, the North American Society of Pediatric Gastroenterology, Pathology and Nutrition published a clinical, diagnostic and therapeutic guide to *Helicobacter pylori* infection in children under 18 years of age with a prevalence of 59% [6]. According to Guillermo, Dietriech, Brenner, in 2014, there is a considerable link between *Helicobacter pylori* and gastroduodenal pathologies recognised everywhere in adult medicine, but unfortunately its existence in children is often ignored or forgotten [7].

Gastric cancer is the second most common cause of cancer-related death worldwide. The current incidence is estimated at 16.2% per year, higher in East Asia, Eastern Europe and South America [8]. This cancer has a poor prognosis with a 5-year survival rate of 20%. It is responsible for 5,000 deaths per year worldwide, but also gastric ulcers are more or less deep wounds in the mucosa of the stomach. They can lead to perforations of the gastric wall and cause inflammation of the abdominal cavity and infection of the peritoneal mucosa [9].

In addition Serval in 2021, indicated that there are factors that are associated with childhood gastritis as in case of allergy in 11% of children, digestive tuberculosis in 11%; autoimmune pathologies in 57% of cases, celiac disease in 4.6%, are associated with Crohn's disease in 2.3%, and caustic in 2.3% [10].

According to the classification of Kalach, Bontems, Raymond in 2018, the average age of the disease was 8 years and 8 months (8.7 years) with a female predominance; gastritis was also associated with abdominal pain in 47.2% of cases, vomiting (23%), haematemesis (15%) and other signs such as dyspepsia, delay in height, anaemia, diarrhoea, etc., accounting for 14.8% of cases [11].

According to a study conducted by Raymond, Kalach, Lamarque, Burucoa in 2010, Helicobacter affects 20 to 30% of individuals in industrialised countries, depending on age: 0 to 25% in children, 60% in adults. In developing countries, the prevalence is 60-90% with an acquisition rate of 0.5-2% per year in children and 0.4% in adults [12].

According to a study in Finland, Japan and the United States of America, the prevalence of chronic gastritis is 28% in the general population, 75% in people over 50 years of age. In Western countries, it is about 25%. The rate is high in third world countries. In France, the rate is between 15 and 30% of the adult population carrying this bacterium [13].

In Black Africa, epigastralgia is a frequent reason for consultations, including 10% of hospital consultations and more than 60% of indications for upper digestive endoscopy [14]. In Libreville, Gabon, 16.4% of patients were referred for upper GI endoscopy, and the prevalence rate for reflux is less than 10%. In Europe, the prevalence of Helicobacter pylori varies between 25 and 50%. In Nigeria, seroprevalence is 58% before one year of age and 69% at ten years of age [15]. According to Mounia, Abdeladim, Moustapha in 2012, the prevalence of Helicobacter

pylori gastritis in a population with symptomatic gastritis is 60%, the mean age in her series is 9 years with extremes between 1 and 17 years [16].

In the Democratic Republic of Congo, a study conducted at the Centre Médical Evangélique Nyankunde and at the Clinique de Béni, revealed that the average age of gastritis patients was 14.3 to 47.5 years. Epigastralgia was present in 80.5% of patients, functional dyspepsia was observed in 1.5% of cases; irritable bowel syndrome was associated with dyspepsia in 13% of cases, the causes of organic dyspepsia encountered were due to gastric (93%), gastro-oesophageal reflux disease (32%), ulcer disease (13%) and cancerous conditions (1%) [17].

In North Kivu, at the Nyakunde Clinic in Beni, the rate of children with gastritis (epigastralgia) was 78.3%, of which 93.6% were carriers of lesions and 22.2% of clinical diagnoses of duodenal and gastroduodenal ulcers were observed in 16.2%, 1.5% and 37.4% of patients respectively, with gastritis found in 31% and stomach cancer in 2.5% of patients [18]. In the city of Butembo, more precisely at Matanda Hospital during the period from January to September 2021, the hospitalization registers show that of 981 children aged 10 to 17 years were registered for various pathologies, 180 for gastric syndromes, i.e. 18.3% [19].

Thus, we asked ourselves the fundamental question: how do the factors combine to cause gastritis at Matanda Hospital? From this basic question, the following specific questions arise: What are the factors associated with gastritis in children aged 10-17 years at Matanda Hospital? Is there a difference in the coasts of these factors between cases and their controls?

This research hypothesises the existence of a significant difference in the distribution of gastritis factors in children between cases and their controls.

The aim of this study is to study infantile gastritis in order to identify the factors and limit their influence through a fight aimed at contributing to the improvement and promotion of children's health in the city of Butembo.

Specifically, the study aims to identify the determinants of gastritis in children aged 10 to 17 years at Matanda Hospital and to determine the difference in the distribution of these factors among the cases and their controls.

2. METHODOLOGY

2.1 Presentation of the research setting

Our research was conducted at Matanda Hospital located in the urban-rural health zone of Katwa, 1 km from the commercial centre, on the left-hand side of the main Butembo-Goma road. It enjoys a mountain climate with an average temperature of 25oC and is situated on a hill at an altitude of about 1800 metres.

2.2 Materials and methods

This is an analytical case-control study so that it focuses on the analysis of the exposure of gastritic children to a disease factor in the past, i.e. a retrospective approach.

2.3 Study population and sampling technique

2.3.1 Study population

For this study, the population consisted of all gastritic and non-gastritic children aged 10-17 years registered in the internal medicine department at Matanda Hospital.

2.3.2 Sample

The study sample is a non-probability sample of the casual or convenience type. Thus, the sample size was 180 children aged 10-17 years, of which 90 cases were children with gastritis and 90 children without gastritis in terms of controls.

2.3.3 Sampling techniques

We drew a non-proportional sample size, the sample being of the non-probability type for convenience given the size of the study and the time frame of our research. Each case identified for follow-up for gastritis was matched with two controls with the same characteristics excluding gastritis.

2.2.4 Data collection tool and technique

We used a checklist or collection grid. The checklist, although written in French, was translated into the local language during the interview with the respondent child, our interlocutor in the case of mastication.

Documentary analysis was useful as a data collection technique. The interview with the caregivers was also useful whenever we had necessary information on cases of gastritis that were not found in the registers consulted or that had been misreported.

The following variables were analysed in this study: age, gender, self-medication of children, history of alcoholism, history of smoking, psychological stress, abuse of NSAIDs, mealtime, food hygiene condition, chewing coefficient.

2.4.5 Statistical analysis

The data from our investigations were processed automatically in Epi-Info software, version 7, for analysis; this enabled us to draw up contingency tables. We also used percentage and Odds ratio calculations to better interpret the results.

3. RESULTS

3.1 Data related to individual factors

3.1.1 The age of the children

Table 1 shows that out of 90 children with gastritis, 39 (43%) were aged between 10 and 13 years, while 51 (57%) were aged between 14 and 17 years. However, of the 90 children without gastritis, 62 (31%) were aged between 14 and 17 years. The frequency of the age range 10-13 years is lower (43%) in gastritic children than in non-gastritic children (69%). With an OR= 0.34 (0.19-0.64), we can conclude that age is not a factor associated with gastritis.

Table 1. Frequency of gastritis by age of cases and controls

	With Gastritis	Without Gastritis	Total	OR (95% CI)	IV

Age	f	%	f	%	f	%	0,34 (0,19-0,64)	NS
10-13 years old	39	43	62	69	101	56		
14-17 years old	51	57	28	31	79	44		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.1.2 Sex of the children

The data in Table 2 show that of the 90 gastritic children, 46 (51%) were female and 44 (49%) were male, while in the non-gastritic children, 30 (33%) were male and 60 (67%) were female. The frequency of female sex is lower in gastritic children (51%) than in non-gastritic children (67%). With OR=0.52 (0.28-0.95); we realise that gender is not a factor associated with gastritis in children.

Table 2. Frequency of gastritis according to sex of cases and controls

	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
Sex	**f**	**%**	**f**	**%**	**f**	**%**	0,52 (0,28-0,95)	**NS**
Female	46	51	60	67	106	59		
Male	44	49	30	33	74	41		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.1.3 Self-medication of children

Table 3 shows that 59 (66%) of gastritic children had a history of self-medication while 31 (34%) did not, while 20 (22%) of non-gastritic children were self-medicating while 70 (78%) were not. The frequency of self-medication is higher in gastritic children (66%) than in non-gastritic children (22%). This OR of 6.66 indicates that self-medication is a factor associated with gastritis in children.

Table 3. Frequency of gastritis according to self-medication in cases and controls

	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
Self-medicating	**f**	**%**	**f**	**%**	**f**	**%**	6,66 (3,44-12,89)	S
Present	59	66	20	22	79	44		
Absent	31	34	70	78	101	56		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.2 Data related to behavioural factors

3.2.1 On the history of alcoholism

Table 4 shows the following results: Of 90 gastritic children, 36 or 40% had a history of alcoholism, while 54 or 60% had no history of alcoholism. Of the non-gastritic children, 28 (31%) had a history of alcoholism and 62 (69%) had none. The frequency of a history of alcoholism was higher in gastritic children (40%) than in non-gastritic children (31%). An OR=1.47 naturally implies that a history of alcoholism is a factor associated with gastritis in children.

Table 4. Frequency of gastritis according to alcohol history in cases and controls

History of alcoholism	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
	f	%	f	%	f	%	1,47 (0,79-2,72)	S
Present	36	40	28	31	64	36		
Absent	54	60	62	69	116	64		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.2.2 History of smoking

Table 5 shows that out of 90 gastritic children, 7 (8%) had a history of smoking, while 83 (92%) had none. In contrast, 5 (94%) of the non-gastritic children had a history of smoking, while 85 (94%) had none. The frequency of smoking history was higher in children with gastritis (70%) than in non-gastric children (6%). The OR being equal to 1.19 (OR>1) convinces us of a true association between smoking history and gastritis.

Table 5. Frequency of gastritis according to smoking history in cases and controls

	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
History of smoking	f	%	f	%	f	%	1,19	
Present	7	8	5	6	12	37		
Absent	83	92	85	94	168	83		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.2.3 Psychological stress

Looking at the data in this table 6, it appears that among the 90 gastric children, 4 (4%) were in a state of stress while the psychological state was normal in 86 (96%). Among the non-gastric children, 2 (2%) were under stress, while 88 (98%) were free of stress. The frequency of stress was higher in children with gastritis (4%) than in those without gastritis (2%). Given an OR= 2.04 we conclude that psychological stress is a factor associated with gastritis in children.

Table 6. Frequency of gastritis according to stress in cases and controls

	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
Psychological stress	f	%	f	%	f	%	2,04	
Present	4	4	2	2	6	3		
Absent	86	96	88	98	174	97		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.2.4 Abuse of NSAIDs

From Table 7, it can be seen that 35 or 39% of gastritic children abused NSAIDs, while 55 or 61% did not. While 27 (30%) of non-gastritic children misused NSAIDs, 63 (70%) did not misuse them at all. The frequency of NSAID misuse is higher in gastritic children (39%) than in non-gastritic children (30%). Thus, we realise that with OR=1.48 (OR>1) NSAID misuse is a factor associated with gastritis in children.

Table 7. Frequency of gastritis by NSAID misuse in cases and controls

Use of NSAIDs	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
	f	%	f	%	f	%	1,48	
Abusive	35	39	27	30	62	34		
Non-abusive	55	61	63	70	118	66		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.3 Data related to nutritional factors

3.3.1 Meal schedule

Table 8 shows that among the 90 gastric children, 86 (96%) had an irregular meal schedule while 4 (40%) had a regular meal schedule. Among the non-gastric children, 84 (93%) had an irregular meal schedule, while 6 (7%) had a regular schedule. The frequency of irregular mealtimes was higher in gastritic children (86%) than in non-gastritic children (84%). With OR=1.5 (OR>1), we read that irregular mealtimes are a factor associated with gastritis.

Table 8. Frequency of gastritis according to irregular meal schedule in cases and controls

	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
Meal time	f	%	f	%	f	%	1,5	
Irregular	86	96	84	93	170	94		
Regular	4	4	6	7	11	6		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.3.2 Food hygiene conditions

The data in Table 9 show that out of 49 (54%) gastritic children were in poor food hygiene conditions, while 41 (46%) were in good food hygiene conditions. Of the 90 non-gastritic children, 37 (41%) lived in poor food hygiene conditions, while 53 or 59% were not. The frequency of poor food hygiene conditions was higher among gastritic children (54%) than among non-gastritic children (41%). With an OR=1.7, we note the positive association between poor food hygiene and gastritis.

Table 9. Frequency of gastritis according to food hygiene conditions in cases and controls

	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
Nutritional condition	f	%	f	%	f	%	1,7	
Bad	49	54	37	41	86	48		
Good	41	46	53	59	94	52		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3.3.3 The coefficient of mastication

The data in Table 10 show that 36 (40%) of the gastritic children had a poor chewing coefficient, while 55 (60%) had complete chewing. Of the 90 non-gastritic children, 25 (28%) chewed superficially and rapidly, while 65 or 72% chewed correctly. The frequency of poor

chewing was greater in gastritic children (40%) than in non-gastritic children (28%). With an OR=1.73, we find a positive association between poor chewing behaviour and gastritis.

Table 10. Frequency of gastritis according to poor mastication coefficient in cases and controls

	With Gastritis		Without Gastritis		Total		OR (95% CI)	IV
Mastication coefficient	**f**	**%**	**f**	**%**	**f**	**%**	1,73	
Bad	36	40	25	28	61	34		
Good	54	60	65	72	119	66		
Total	**90**	**100**	**90**	**100**	**180**	**100**		

3. DISCUSSION

4.1 Age

In this study, it was found that the frequent age group (43%) was 10-17 years with an OR=0.34 (Table 1). Abdul et al [4], in their study in South Australia" found 69% gastritis in patients aged 10-19 years. H. pylori infection is most often acquired in childhood during the early years of life. However, other authors such as Ndiaye et *al* [20] in Senegal, in their study in the Regional Centre of Ziguinchor, about 35 cases" found no association between age as a factor associated with gastritis in children aged 10-18 years.

In developing countries, high prevalences are observed in childhood during the first 10 years of life, reaching 80% in adolescence and then remaining stable in adults (145). This has been confirmed by several studies such as those carried out in the Maghreb and Middle East countries and in some African countries (Côte d'Ivoire 55% of children under 10 years of age)

For her part, Afara Souad [1] noted an average age of 9 years. This is close to the study by Maherzi who showed an average age of 11.5 years in his series from Rabat in a proportion of 86.1% of cases [22].

4.2 Sex

This distribution is variously estimated by the authors, the male predominance is reported by several studies published in the literature.

However, the results of this series show a predominance of females (49%) in gastritic children than in non-gastritic children (33%) with OR=1.91 (table 2). Amel et al [21] in Morocco, in their study show that the male sex represented 53.1% (OR=3.01). This result is close to the literature which shows the predominance of males in the majority of studies of infantile gastritis.

For example, the study by Afara Souad [1] observed more than half of the patients to be male, 51.6% of the boys infected compared to 48.3% of the girls, the sex ratio F/G is 0.94. No

justification was given by the authors so it is thought that this predominance is due to simple chance or to boys being exposed to risk factors more than girls.

4.3 Self-medication

The frequency of self-medication is higher (66%) in gastritic children than in non-gastritic children (22%) with OR=6.66. In 2006, Gottrand [23], in his study shows that 97.3% of complications associated with self-medication and incriminates self-medication as a risk factor for gastritis OR=1.8. This coincidence would come from the irritant effect of some self-medication products.

Care should be taken with self-medication when you do not know what you are treating. The doctor may decide to prescribe a drug before asking for tests because ulcers, gastritis and oesophagitis usually improve within a week of starting treatment.

4.4 History of alcoholism

Helicobacter pylori infection should only be investigated (and treated) if there are gastrointestinal lesions that can be linked to the infection. The aim of clinical investigations in a child with gastrointestinal symptoms is therefore to determine the cause (gastritis, more rarely gastric or duodenal ulcer), and secondarily to look for a possible H. pylori infection that could explain the gastrointestinal lesions observed.

Our results show a higher frequency of history of alcoholism in gastritic children (40%) than in non-gastritic children (31%) with OR=1.47 (Table 4). Abdul et *al* in 2017, in their study of factors associated with the severity of gastritis in children from 210 cases in South Australia show that 36% of children with gastritis had a history of alcoholism [4]. The irritation of the stomach caused by alcohol on the gastric mucosa, in addition to the anorexia characteristic of alcoholism, would explain the increase in gastritis in subjects with a history of alcoholism.

Alcohol stimulates the stomach lining and the production of stomach acid. This can cause stomach pains or upset stomachs, accompanied by nausea and vomiting. Irritants such as alcohol, drugs, highly spiced foods, injuries and exposure to bacteria can all lead to illness.

Alcohol is the primary cause of acute inflammation of the stomach (acute erosive gastritis). Chronic changes in the mucosa (chronic gastritis) interfere with the absorption of certain substances and vitamins (e.g. vitamin B12). These disorders precede cancer by several years.

4.5 History of smoking

In this series, a significant frequency of smoking history was demonstrated in gastritic children (7%) than in non-gastritic children (6%) with OR=1.19 (Table 5). According to Delcroix et al [24] in their study of the impact of smoking on the health of adolescents in 450 cases in Tunisia, approximately 81% of exposure to smoking in association with gastritis was observed. This was corroborated by Fukushima, Strauss, Waring [26]. This is due to the presence of polyaromatic hydrocarbons and heavy metals in cigarette smoke. These components destroy the gastric mucosa.

4.6 Psychological stress

The high frequency of stress is present in gastritic children (4%) than in non-gastritic children, resulting in an OR of 2.04 (Table 6). Amel et al, in their study of 2013 in Morocco, observed 10% of gastritis associated with stress [21]. Their results are close to ours. This can be explained by the fact that while under stress, the stomach produces more gastric juice which has a harmful effect on the gastritis mucosa and is the source of acute gastritis. Stress is also sometimes accompanied by a slight loss of appetite.

4.7 Misuse of NSAIDs

In this series, the frequency of NSAID misuse is higher in gastritic patients (39%) than in non-gastritic patients (30%), with OR=1.4 (OR>1). The same finding was made in a study conducted by Abdul et *al* in 2017, which showed that NSAID misuse is a significantly associated factor with gastritis at P=0.04; OR=1.7 (CI.10%) [4]. This is because NSAIDs stimulate the release of prostaglandins involved in hydrochloric acid secretion.

4.8 Meal timing

It was observed in this study that the frequency of irregular mealtimes was higher (86%) in gastritic children than in non-gastritic children (84%), with OR=1.5. In a study conducted by Belco in 2006 in Bamako on the impact of a varied diet on health in 10 cases, 90% of cases of irregular feeding were observed as a risk factor for gastritis [25].

4.9 Food hygiene conditions

Poor food hygiene conditions were likely to be associated with gastritis (OR=1.7) and were more common (54%) in gastritic children than in non-gastritic children (41%). In Morocco, Amel et al [21] showed 80% of gastritis in children under 20 years of age in association with poor food hygiene with OR=3.01. This result corroborates ours, especially since this poor food hygiene is due to an unvaried diet, to the intake of poorly cooked and preserved food that forces the stomach to work hard.

According to the study by Afara Souad [1], the majority of patients lived in a community and came from a low socio-economic level. Numerous studies in both children and adults have confirmed the association of seroprevalence with living conditions: poor hygiene, crowded conditions and communal living are all risk factors for *Helicobacter pylori* infection. The prevalence of H. pylori infection has been shown to be 35% in children from poor backgrounds compared to 21% in those from affluent backgrounds ($p < 0.05$); similar results have been reported in the USA and Chile.

We believe that family income, which is one of the most important criteria of socio-economic status, was also well correlated with the rate of *Helicobacter pylori* infection.

4.10 The chewing coefficient

Poor mastication coefficient is associated with gastritis (OR=1.73) in our study. According to Kalach [27], maternal pre-mastication is also a risk factor for infantile gastritis in 58.2% of cases.

A study on risk and prognosis factors of children with gastritis at the gynaecological and paediatric hospital in Yaoundé on 120 cases, concluded that poor mastication coefficient is a factor associated with gastritis in children under 18 years with P=0.007; OR =1.8; CI (95%). This similarity of results would be explained by the fact that poor mastication leads to prolonged breakdown (stirring and kneading) of the food bolus at the gastric level and makes the stomach work harder" (Miaffo et *al*, 2012).

CONCLUSION

The present study investigated the factors associated with gastritis in adolescents aged 10-17 years at Matanda Hospital. Indeed, gastritis being an inflammation of the stomach lining, its origins are very specific depending on the type. It is a condition that is often overlooked and ignored in adolescents.

The general aim of the study was to study infantile gastritis in order to identify the factors involved and to limit their influence through a fight aimed at improving and promoting the health of children in the town of Butembo. Specifically, the aim was to identify the determinants of gastritis in adolescents aged 10-17 years at Matanda Hospital and to determine the difference in the distribution of these factors among cases and their controls.

The study sample comprised 180 children aged 10-17 years, of whom 90 were cases (gastritic children) and 90 were controls. An analytical case-control study, which allowed us to collect data by means of an interview guide using both documentary analysis and interview. The data were interpreted by calculating the percentage and the Odds Ratio.

After analysis, the following results were obtained: the factors associated with gastritis in adolescents aged 10 to 17 years were selected: self-medication with OR=6.66, history of alcoholism with OR=1.47; history of smoking with OR=1.19, psychological stress with OR=2.04; misuse of NSAIDs with OR=1.4; irregular meal with OR=1.53; poor food hygiene with OR=1.7 as well as poor chewing coefficient with OR=1.73.

The above results confirm our hypothesis that self-medication, history of alcoholism and smoking, psychological stress, NSAIDs misuse, irregular meal intake, poor food hygiene and poor mastication coefficient are the main factors associated with gastritis in adolescents.

Given that gastritis has taken on worrying proportions in our communities, particularly among adolescents, we suggest that: Health authorities: provide health establishments with modern medical equipment in order to make a definitive diagnosis for better medical care of patients. To the nursing staff: to effectively manage gastritis without ignoring it in adolescents to avoid complications. To gastritis sufferers: to be consulted regularly in hospital and in time for better

management. Finally, parents of gastritic adolescents: to behave with dignity towards their adolescents suffering from gastritis, to avoid stressing them, and to feed them well by scrupulously observing the rules of food hygiene.

Study limitation

As an analytical study based on interview and literature review, we were not able to collect and analyse samples in the laboratory for the diagnosis of Helicobacter pylori, the causative agent of gastritis.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors

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