

Prevalence of Heartburn in Abidjan, a Black African Country, and Associated Factors

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Abstract

Aims: To determine the prevalence and risk factors of heartburn in Abidjan, a black African city. **Patients and Methods:** cross-sectional study from June 15 to September 30, 2003. One thousand nine hundred forty (1940) persons from five health zones of the city Abidjan were included after their informed consent. Socio demographic and clinical parameters were collected using a questionnaire in an interview format. Heartburn was defined as a discomfort or burning sensation extending from the sternal manubrium to the base of the neck. Factors related to the complaint were asked such as predisposing factors, habits (tobacco, alcohol and coffee intake) and body mass index. Stepwise multiple logistic regression analyses were used to examine associations between these factors and heartburn. **Results:** Among 1940 respondents (mean age 28 ± 9 years; sex ratio (M:F) 0.86), heartburn occurred in 433 persons (once a week in 9.2% of case (178 persons)). Five factors were statistically associated with heartburn: male sex ($p = 0.025$, OR = 0.555 [CI95% 0.331 - 0.930]), heartburn in a family member ($p = 0.010$, OR = 1.765 [95%CI 1.143 - 2.725]), constipation ($p = 0.011$, OR = 2.182 [95%CI 1.1953,983]), right lateral decubitus ($p = 0.001$, OR = 6.247 [95%CI 2.079 - 18.775]) and after a meal ($p = 0.000$, OR = 2.643 [95%CI 1.594 4.383]). **Conclusion:** Heartburn is common in this black African population. Male sex appears to be less associated. Constipation, right lateral decubitus and after a meal are trigger factors for heartburn. Heartburn in a family member is a risk factor.

Keywords

Gastro-Esophageal Reflux Disease; Heartburn; Regurgitation; Abidjan; Epidemiology; Clinical

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1. Introduction

Heartburn is a public health problem in the West [1]. Its prevalence is high as well as its socio-economic costs [2]. It affects the quality of life of patients [3] [4] and exhibits long-term risk of esophageal adenocarcinoma via the Barrett's esophagus [5] [6].

In Africa, few studies have been published [7]-[14]. They are exclusively hospital and endoscopic series unrepresentative of the general population. Besides, few of the studies have specifically addressed heartburn in a black African context [8] [15] [16]. Mindful of the possible influence of differing demographic, nutritional, lifestyle and genetic factors, the present study was designed. The aim of our study was to determine in Abidjan, Cote d'Ivoire, prevalence and associated factors of heartburn.

2. Materials and Methods

2.1. Subjects

It was a cross-sectional study from June 15, 2003 September 30, 2003 inclusive. Abidjan is a city of 5 million people whose health division is made in five areas balanced health center. All persons over 15 years, living in one of five health zones of the city of Abidjan were included. All study participants had given their informed consent. Patients refusing or unable to respond to the questionnaire were not included in the study.

The sample size chosen was estimated at least 1825 persons in a calculated expected prevalence of 5% with a risk alpha and beta respectively 5% and 1%. The construction of the sample was made taking into account the administrative division population.

First of all, the nature and objective of the questionnaire were explained and after obtaining verbal informed consent, the questions were proposed.

2.2. Questionnaire

The information collection was done by interview on the basis of a pre-established questionnaire that we filled ourselves. This questionnaire was validated in a sample of nearly 50 persons.

The questionnaire included questions related to the following information:

- 1) Presence and characteristics of heartburn as to location and frequency. Heartburn was defined by a discomfort or burning sensation extending from the sternal manubrium to the base of the neck and occurred once a week.
- 2) Demographic variables: age, gender.
- 3) Genetic and physiological factor: heartburn in a family member, pregnancy
- 4) Biometry: body mass index: $BMI = \text{weight, } W \text{ (kg)}/\text{height}^2, \text{ (m)}$.
- 5) Lifestyle and food habitus trigger heartburn: type of food (fat, chocolate), posture, soft drinks or alcohol, tobacco, tea, constipation.

2.3. Statistical Tests

A P-value of 0.05 or less was considered to be statistically significant and all reported P-values were two-sided. The data were analyzed using the statistic packaging for social science (SPSS* version 17 California, USA). We used chi-square test for categorical variable, "t" Student for continuous variables and the odds ratio (OR) for the correlations. Univariate and multivariate logistic regression analysis was performed to identify risk factors of heartburn. Our study was consistent with the principles of the Helsinki Declaration of 1975 revised in 1983.

3. Results

We interviewed 2025 persons in all sites, excluded 85 persons (inability to correctly answer questions) and ultimately identified 1940 persons (95.8%). Of these 1940 persons (mean age 28 ± 9 years; sex ratio (M:F) = 0.86), 433 described episode of heartburn. **Table 1** shows the characteristics of the study population. Seventy eight women reported being pregnant (7.4% of the women). The majority of the persons interviewed (60%) had less than thirty years. Heartburn was described in 22.3% [95% CI 21% - 25%] cases (n = 433). **Table 2** shows characteristics of person with heartburn. Heartburn occurred once a week in 9.12% of case (178 persons). Means of body mass index was respectively in the population study and in person with heartburn 22.9 (standard deviation

3.2) and 22.8 (standard deviation 3.3). The intensity of heartburn was moderate or mild in 60% of case. In **Table 3**, we present in multivariate analysis potential factors associated with heartburn. Five factors were statistically associated with heartburn: constipation, right lateral decubitus, male sex, after a meal and heartburn in a family member.

4. Discussion

Heartburn was described by 433 persons (22.3%) in our study. The prevalence of heartburn once a week was 9.2% (178 persons). In most studies, the definition of heartburn was effectively combined with its weekly frequency [3]. On these criteria, the prevalence of heartburn is estimated to 9.2% in our study, inferior (10% to 30%) to that reported in several studies out of Africa [2] [6] [17]-[20]. In Africa, Ntagiribi *et al.* [16] had observed similar data in student's population where the frequency of heartburn was 22.5% regardless of the frequency of occurrence. Except of this study, in addition to diagnostic difficulties noted above, the studies in Africa were all performed in a specialized in gastroenterology or endoscopy unit, very unrepresentative of the general population.

Table 1. Socio demographic and clinical characteristics of 1940 persons.

Parameter	Effective	Percent
Site		
Abidjan east	251	12.9%
Abidjan middle	419	21.6%
Abidjan south	422	21.8%
Abidjan north	467	24.1%
Abidjan west	381	19.6%
Sex		
Male	898	46.3%
Female	1042	53.7%
Age (years)		
[15 - 20]	261	13.4%
[21 - 30]	904	46.6%
[31 - 40]	417	21.5%
[41 - 50]	221	11.4%
[More than 50 years]	137	7.1%
Digestive symptom*		
heartburn	433	22.3%
Regurgitation	487	25.1%
Nausea	707	36.4%
Epigastralgia	720	37.1%
Hiccup	348	17.9%
Eructation	401	20.7%
Dysphagia	101	5.2%
Odynophagia	50	2.6%
Potentially associated factors		
Tobacco	203	10.5%
Alcohol	645	33.2%
Pregnancy women n (% of women)	78	7.5%
Body Mass Index (Kg/m ²)		
<25	1485	76.5%
25 - 35	403	20.8%
>35	52	2.7%

*A patient could have more than one symptom.

Table 2. Characteristics of patients with heartburn.

Parameter	Heartburn	
	Effective	Percent
Age (years)		
[15 - 20]	67	15.5%
[21 - 30]	186	42.9%
[31 - 40]	89	20.5%
[41 - 50]	55	12.7%
[51 and more]	36	8.4%
Sexe		
Male	180	41.6%
Female	253	58.4%
Intensity		
Mild	95	21.9%
Moderate	165	38.1%
Severe	170	39.3%
unspecifing	3	0.7%
Frequency		
Days	78	18%
Week	100	23%
Month	164	38%
Years	82	19%
Unspecifing	9	2%
Potentially associated factors		
Tobacco	40	9.2%
Alcohol	148	34.2%
Percentage of pregnancy women n (% of women)	78	4%
Body mass index		
<25	343	79.2%
25 - 35	77	17.8%
>35	13	3%

Table 3. Independent factors of heartburn (multivariate analysis) in the study.

Parameter	Odds ratio	95%CI	P
Male sex	0.555	0.331 - 0.930	0.025
Site of survey	1.051	0.674 - 1.639	0.826
Tabacco	0.896	0.389 - 2.064	0.797
Chocolate	1.241	0.752 - 2.046	0.398
Tea	0.737	0.407 - 1.334	0.314
Coffee	0.786	0.501 - 1.234	0.296
Constipation	2.182	1.195 - 3.983	0.011
Pregnancy	0.587	0.210 - 1.636	0.308
Hearburn in familily member	1.765	1.143 - 2.725	0.010
Left lateral decubitus	0.485	0.130 - 1.818	0.283
Right lateral decubitus	6.247	2.079 - 18.775	0.001
Supine	0.823	0.465 - 1.457	0.503
Stress	1.398	0.847 - 2.308	0.190
Before a meal	0.905	0.514 - 1.593	0.729
Mornig	1.179	0.750 - 1.852	0.475
Anteflexion	1.101	0.569 - 2.129	0.776
After a meal	2.643	1.594 - 4.383	0.000
Night	1.331	0.846 - 2.094	0.216
Alcohol	1.329	0.788 - 2.240	0.286
Soda	0.783	0.483 - 1.268	0.320
Siesta	1.206	0.783 - 1.859	0.396
Fat diet	1.260	0.817 - 1.945	0.296
Body mass index	0.993	0.929 - 1.062	0.840

Our study recruits individuals only on criteria of geographical location, regardless of whether or not a clinical symptom. Thus, our study focused only heartburn prevalence. Generally in all African studies, patients were recruited either because of gastrointestinal symptoms or in a specialized gastroenterology either from register including gastroscopy and patients with typical symptoms, and atypical extra digestives sign of gastroesophageal reflux disease. Our work was restricted to the detection of heartburn in persons in one of the five health districts of Abidjan.

Five factors were statistically associated with heartburn in our study: constipation, right lateral decubitus, male sex, after a meal and heartburn in a family member. Constipation during irritable bowel syndrome can be associated with heartburn according to Dent *et al.* [3]. The literature data were conflicting concerning protective effect of male sex: according to some authors there was a female predominance of Heartburn [1] [2] [21] [22] for others there was no connection with sex [17] [23]. In our study, male sex was less associated with the occurrence of heartburn. But, since heartburn is more frequent during pregnancy, this may have influenced the prevalence in female sex (7.4% of the women in our study were in pregnancy). There is sparse, but positive, data on the association between gastroesophageal reflux disease and genetic factors in some studies included in the systematic review of Dent *et al.* [3]. The majority of patients reflux in the right lateral decubitus position. Transient low esophageal sphincter relaxations, primarily in the right lateral decubitus position, are currently recognized as the main pathophysiological abnormality in gastroesophageal reflux disease [24]. The relationship heartburn and the others factors examined in our study are also not clear as concluded in several studies [1] [3] [24]-[27]. We must forget that other dietary factors (specific to African culture or not) or related to lifestyle (exercise, education, socio-professional category) could influence (or trigger protective effect) heartburn have not been studied in our work. The lack of the gastroscopy is a major limit of the study.

5. Conclusion

Heartburn is common in this black African population. Male sex seems less associated with the occurrence of heartburn. Heartburn in a family member is a risk factor. Constipation, right lateral decubitus and after a meal are trigger factors for heartburn.

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