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Original article

Prevalence of Achalasia in Colombia: Data from the Official Records of the Ministry of Health, 2017–2024

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Abstract

Introduction: The global prevalence of achalasia is low, estimated at between 7 and 32 cases per 100,000 inhabitants. Colombia is an endemic country for Chagas disease, and variants of the human leukocyte antigen DQ (HLA-DQ) have also been identified in the population. These factors may influence the disease's prevalence compared to global figures. **Methods:** This was a descriptive, cross-sectional study based on information from the database of Integrated Information System for Social Protection of Colombia (SISPRO). Prevalence was estimated based on healthcare encounters coded with ICD-10 diagnosis K22.0, corresponding to "achalasia of the cardia," during the period from 2017 to 2024. The analysis was stratified by department, sex, and age group. **Results:** A total of 9,621 cases of achalasia were recorded nationwide, with a prevalence of 21.8 cases per 100,000 inhabitants. Females accounted for 59.4% of the cases (95% CI: 58.4%–60.4%). The departments with the highest prevalence were Atlántico, Córdoba, Magdalena, and Bogotá, with 47, 39, 35, and 26 cases per 100,000 inhabitants, respectively. A progressively higher prevalence was observed with increasing age. **Conclusions:** The estimated prevalence of the disease in Colombia aligns with global reports. Further studies are needed to confirm geographic differences in prevalence and their possible underlying causes. These findings are useful for prioritizing resources and improving strategies for the detection and treatment of achalasia in Colombia.

Keywords

Esophageal achalasia, epidemiology, prevalence, Colombia.

INTRODUCTION

Achalasia is a rare chronic disorder characterized by impaired esophageal peristalsis and insufficient relaxation of the lower esophageal sphincter (LES), which hinders the passage of food into the stomach in the absence of structural obstruction in the esophagus or esophagogastric junction (EGJ)[(1)]. Its pathogenesis involves degeneration of ganglion cells in the myenteric plexus, primarily nitric oxide-producing inhibitory neurons, leading to compromised relaxation of esophageal smooth muscle[(2–4)]. It is proposed that achalasia types 1 and 2 result from a cytotoxic immune attack that causes progressive death of myenteric plexus neurons, while in type 3 achalasia, neuronal dysfunction occurs without cell death.

Possible causes include idiopathic and secondary etiologies, such as Chagas disease, herpes zoster, sarcoidosis, amyloidosis, eosinophilic esophagitis, and hereditary syndromes like Allgrove syndrome. Additionally, a potential genetic predisposition linked to human leukocyte antigen DQ (HLA-DQ) variants has been described[(5–7)]. This disease significantly impacts patients' quality of life and

generates high healthcare costs due to the complexity of required treatments, including Heller myotomy, peroral endoscopic myotomy (POEM), and esophageal dilations. In countries like the United States, annual costs per treated patient range between 3,000 and 14,000 USD[8].

A systematic review of the global epidemiology of achalasia from 1925 to 2021 described an increasing prevalence trend over the years, reaching 7.54 cases per 100,000 inhabitants between 1952 and 1999 and 16.9 cases per 100,000 inhabitants between 2018 and 2021. Most studies were conducted in Asia, Europe, and the United States and agree that this disease is more common in adults. However, some geographical differences exist, with Oceania having the highest prevalence at 16.9 cases per 100,000 people[9]. In South America, and particularly in Colombia, there are no epidemiological data on achalasia prevalence. Colombia is an endemic region for Chagas disease, and HLA-DQ variants have been reported in the population, which could influence disease prevalence compared to global records[4,9].

The Individual Health Service Provision Records (RIPS) are mandatory in Colombia's healthcare system and contain data from over 500 million medical encounters, making them a previously used resource for estimating the prevalence of various diseases[10–12]. Since they include information from all patients enrolled in the healthcare system (99.12% of the country's population), they represent an invaluable source for estimating disease prevalence in Colombia[13]. This study aims to determine the prevalence and geographical distribution of achalasia in Colombia by analyzing RIPS data.

METHODS

We conducted a cross-sectional descriptive study using data from the Integrated Social Protection Information System (SISPRO) database, which contains nationwide records of medical consultations and procedures. Data were extracted from the Individual Health Service Provision Records (RIPS) for patients diagnosed with "achalasia of cardia" (ICD-10 code K22.0) between 2017 and 2024. For each case, we collected additional information including sex, age, and geographic location (by department), with the exception of Guainía and Vaupés departments, which reported no data for this condition.

Disease prevalence was estimated using 2018 national census data from Colombia's National Administrative Department of Statistics (DANE) as the denominator[14]. Analysis was performed by groups according to: reporting department, sex, and age (in five-year intervals); with prevalence calculated per 100,000 inhabitants. Geographic distribution of prevalence was visualized using Tableau software[15].

Ethical Considerations

This research followed international ethical guidelines, including the Declaration of Helsinki and Colombian Ministry of Health Resolution 008430 of 1993, which classifies this study type as "no-risk research." Informed consent was not required as no personally identifiable patient information was published.

RESULTS

A total of 9,621 cases of achalasia were recorded nationwide between 2017 and 2024, with a prevalence of 21.8 cases per 100,000 inhabitants. Prevalence was higher among females, reaching 25.4 cases per 100,000 inhabitants, compared to 18.1 cases per 100,000 among males. Females accounted for 59.4% of cases (95% confidence interval [CI]: 58.4%-60.4%). Prevalence rates and case numbers by sex for each department are shown in **Table 1**. Geographic distribution of departmental prevalence is presented in **Figure 1**.

Nationally, the departments with the highest prevalence were Atlántico (47 cases per 100,000 inhabitants), Córdoba (39 per 100,000), Magdalena (35 per 100,000), Bogotá (26 per 100,000), and Valle del Cauca (25 per 100,000). Most departments showed higher prevalence among women; however, Chocó and Guaviare had higher prevalence in men (6 vs. 5 cases per 100,000 in Chocó, and 5 vs. 3 cases per 100,000 in Guaviare). These findings highlight greater disease prevalence in the country's northwestern region. National data are shown in **Figure 1**.

Age-group analysis revealed the highest prevalence in the 80+ years cohort (121 cases per 100,000). A progressive age-related increase was observed, with notably steeper incidence rises starting at age 55. Sex-stratified prevalence by five-year age groups is presented in **Table 2** and **Figure 2**.

DISCUSSION

This is the first study to estimate achalasia prevalence using comprehensive data from all regions of Colombia, as well as the first to characterize the disease in South America. The estimated prevalence in Colombia's general population aligns with global epidemiological records, which report approximately 7-32 cases per 100,000 inhabitants depending on geographic variation[1,16–18].

The correlation between increasing age and higher disease prevalence aligns with findings from other studies. Recent U.S. publications report rising incidence and prevalence rates, particularly among older adults, where prevalence can reach up to 162 cases per 100,000 people[19]. Notably, our analysis found a slightly higher prevalence in women, contrary to literature suggesting equal sex distri-

Table 1. Case numbers and prevalence of achalasia in Colombia per 100,000 inhabitants by sex and department

Department	Number of Cases		Prevalence per 100,000 inhabitants		Overall prevalence per 100,000 inhabitants
	Female	Male	Female	Male	
Amazonas	2	1	6.3	2.9	5
Antioquia	812	530	26.3	18.4	22
Arauca	9	9	7.6	7.4	8
San Andrés, Providencia and Santa Catalina	5	0	20.0	0	10
Atlántico	634	469	52.7	41.1	47
Bogotá, D.C.	1091	796	29.1	23.2	26
Bolívar	250	151	26.0	15.9	21
Boyacá	110	77	19.1	13.8	16
Caldas	127	74	26.7	16.5	22
Caquetá	39	30	22.0	16.4	19
Casanare	15	10	8.0	5.2	7
Cauca	85	47	13.5	7.6	11
Cesar	96	51	17.3	9.4	13
Chocó	12	15	5.2	6.6	6
Córdoba	370	230	47.4	29.7	39
Cundinamarca	316	202	22.4	14.6	19
Guaviare	1	2	2.9	5.1	4
Huila	60	45	11.9	8.9	10
La Guajira	62	15	14.7	3.7	9
Magdalena	243	200	38.5	31.6	35
Meta	72	55	15.9	11.8	14
Nariño	100	66	14.7	10.1	12
Norte de Santander	90	51	13.2	7.7	10
Putumayo	15	13	10.7	9.1	10
Quindío	71	37	26.9	15.1	21
Risaralda	128	63	29.2	15.7	23
Santander	267	201	26.0	20.4	23
Sucre	102	85	23.7	19.6	22
Tolima	63	63	10.2	10.3	10
Valle del Cauca	594	377	29.9	20.9	26
Vichada	4	2	11.1	4.9	8
Total	**5722**	**3899**	**25.4**	**18.1**	**22**

Table prepared by the authors.

bution. For instance, Van Hoeij et al.'s prevalence study in the Netherlands reported a 1:1 female-to-male ratio[20]. This discrepancy may be explained by Colombian women's higher utilization of healthcare services, as evidenced by their greater representation in RIPS records and the SISPRO platform compared to men[21]. However, similar studies also show higher female prevalence from age 25 onward[22], matching our findings.

The regional variation in prevalence rates may be partially attributable to healthcare access disparities. The geogra-

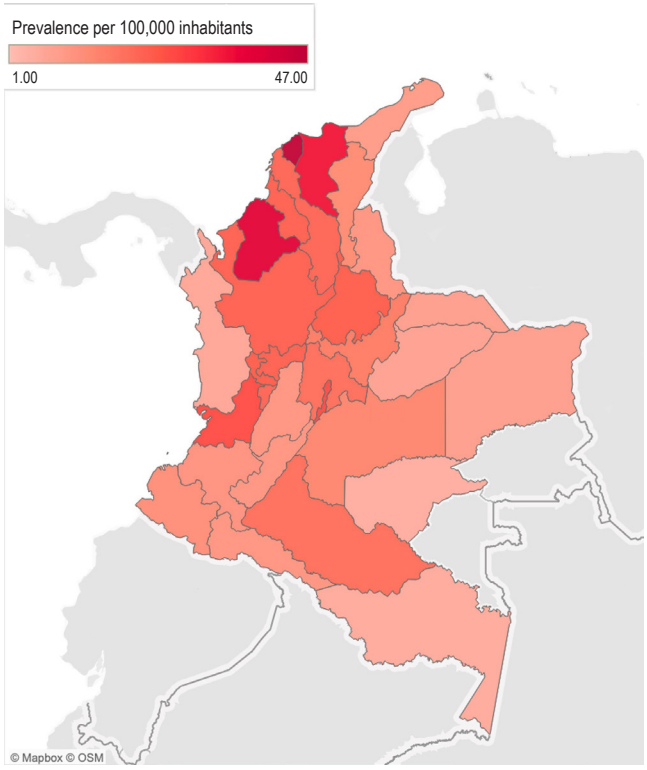

Figure 1. Prevalence map of achalasia in Colombia per 100,000 inhabitants. Image property of the authors.

Table 2. Prevalence of achalasia in Colombia per 100,000 inhabitants by sex and five-year age groups

Age	Female	Male	Total
0-4 years	1.4	2.1	1.7
5-9 years	7.4	9.5	8.5
10-14 years	10.6	11.8	11.2
15-19 years	11.5	9.8	10.7
20-24 years	12.0	10.1	11.1
25-29 years	13.4	8.5	10.9
30-34 years	18.0	10.1	14.1
35-39 years	18.9	14.7	16.9
40-44 years	27.2	18.3	23.0
45-49 years	29.4	17.7	23.9
50-54 years	28.8	19.9	24.6
55-59 years	41.4	26.6	34.5
60-64 years	57.7	36.5	48.0
65-69 years	61.3	43.9	53.3
70-74 years	71.5	59.6	66.1
75-79 years	78.7	67.6	73.8
80+ years	117.0	127.2	121.2
Total	25.3	18.1	21.8

Table prepared by the authors.

phic distribution of achalasia cases is particularly striking in the Caribbean Coast region. Atlántico department shows the nation's highest prevalence rates across most age groups, including children. This finding gains significance when compared to prevalence rates of achalasia-associated conditions like Chagas disease, which is linked not only to achalasia onset but also to complications such as megaesophagus[23]. While Chagas cases have been reported in Atlántico, the disease is more prevalent in northeastern departments like Boyacá, Norte de Santander, and Santander–areas that paradoxically show lower achalasia rates. Similarly, herpes zoster virus infection, another achalasia-associated condition, demonstrates a distinct pattern: while Atlántico reports considerable cases, departments like Córdoba, Amazonas, Valle del Cauca, Sucre, and the San Andrés Archipelago show higher incidence[24,25].

Although achalasia prevalence is not considered significantly influenced by ethnicity[1], the observed geographic differences in Colombia might relate to specific immune response genes, particularly those involved in antineural antibody production. These genes—including *HLA DQA1*01:03* and *DQB1*06:03* alleles—have been associated with up to 30% of achalasia cases[4,9]. In Latin American populations, alleles including *HLA-DRB1*14:54* and *DQB1*05:03* have been identified as potential risk factors in Mexican ancestry individuals[26]. In Colombia, Hernández-Mejía et. al. characterized the distribution of alleles and haplotypes for the HLA-A, HLA-B, HLA-C, HLA-DRB1, and HLA-DQB1 loci in a representative sample of donors registered with the National Bone Marrow Donor Registry. This analysis included data from eight departments (Bogotá, Cundinamarca, Antioquia, Valle del Cauca, Atlántico, Boyacá, Santander, and Tolima). When examining genes associated with achalasia, *DQA1*01:03* and *DRB114:54* were not represented in the study; however, *DQB105:03* was more frequent in Atlántico and Valle del Cauca[27].

STUDY LIMITATIONS

This analysis does not provide an actual prevalence rate but rather an estimate dependent on proper diagnosis

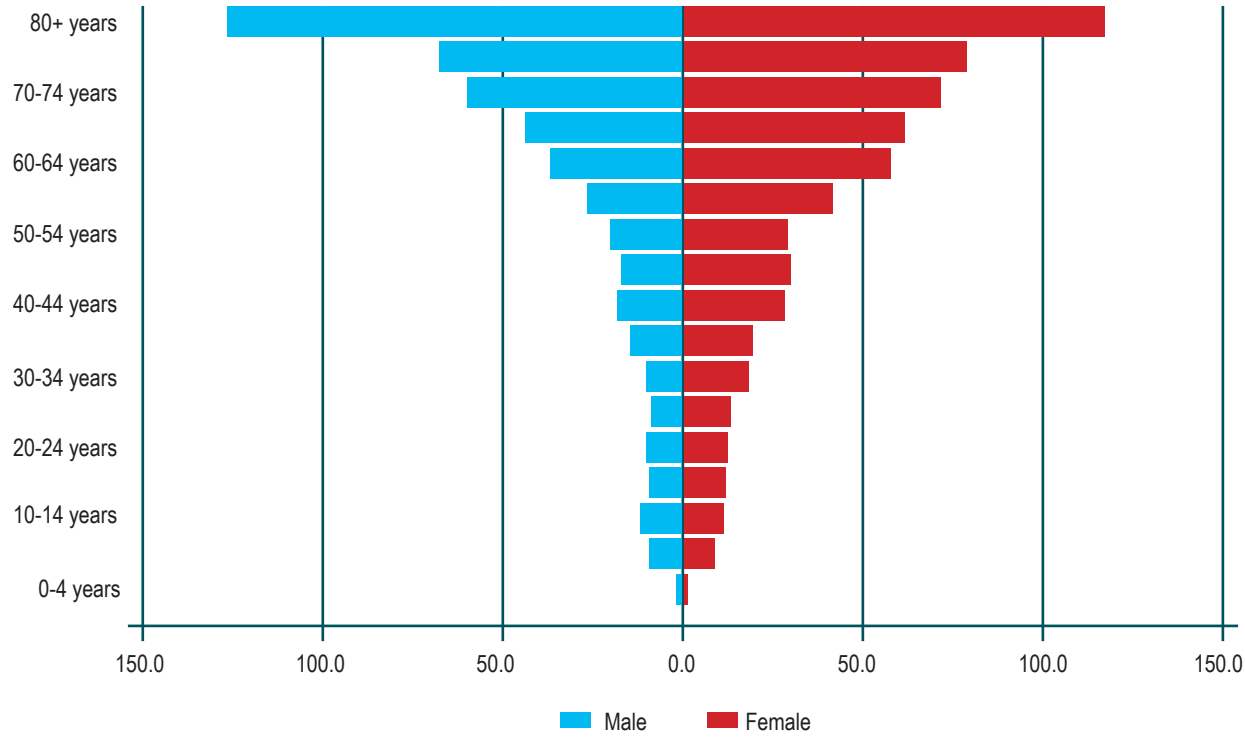

Figure 2. Prevalence of achalasia in Colombia per 100,000 inhabitants by sex and five-year age groups. Image property of the authors.

and accurate recording of data in the RIPS system by healthcare institutions in Colombia. The information platform only stores the primary diagnosis code, which may lead to prevalence underestimation when multiple diagnoses exist or overestimation if a diagnosis is recorded as confirmed without complete diagnostic documentation[28].

Comparisons with data from other countries are limited, and observed differences may be influenced by each study's diagnostic confirmation methods or varying strategies for estimating disease prevalence. Additional studies using standardized and complementary methodologies are needed to confirm not only prevalence rates but also geographic variations in disease presentation and potential associated causes.

CONCLUSION

The estimated prevalence of achalasia in Colombia aligns with global records, despite population differences influenced by genetic, cultural, and environmental factors. Further studies are required to validate these prevalence estimates, investigate geographic variations, and identify potential associated causes. This information is crucial for prioritizing resources and implementing improved detection and treatment strategies for achalasia in Colombia.

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