

Epidemiologic analysis of prevalence of the hyperhidrosis*

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Abstract: BACKGROUND: The present paper aims to study the prevalence of the various manifestations of hyperhidrosis in patients who sought treatment in a specialized ambulatory in the state of São Paulo.

OBJECTIVES: Opposite to previous studies, this paper studies the different combinations of sweating sites, not being restricted to the main complaint site of the patients, but taking into consideration secondary complaints patients may present.

METHODS: This was a retrospective approach of a database containing more than 1200 patients in which were mapped: combination of sweating sites, age of onset, age spectrum, mean age, body mass index and gender of patients. Patients were categorized into four groups based on their main sweating site - palmar, plantar, axillary and facial.

RESULTS: We concluded that hyperhidrosis appears frequently in more than one site, being the main complaint that affects the most patients palmar hyperhidrosis, which appears early in the patients during adolescence. When there are two sites of sweating, the most frequent combination is palmar + plantar, and when there are three sites of sweating the most frequent combinations are palmar + plantar + axillary and axillary + palmar + plantar.

STUDY LIMITATIONS: This research has casuistics limited to a single care service for patients with hyperhidrosis.

CONCLUSION: It is necessary to keep in mind that the disease manifests itself mainly in more than one location, with different intensities in each of the patients, generating a significant impairment of their quality of life.

Keywords: Hyperhidrosis; Epidemiology; Sweating; Prevalence

INTRODUCTION

Hyperhidrosis (HH) is a disease characterized by excessive sweating - in addition to the physiologically necessary - which occurs mainly in the palms of the hands, armpits, soles and face, but can also affect the abdomen, chest, back, inguinal regions and lower limbs.^{1,2} HH has an unknown etiology and is associated with intense emotional, occupational and social stress. It usually begins in childhood or adolescence and entails an important impairment in the quality of life of individuals who have it.³

Studies from several parts of the world have been addressing the epidemiology of HH, but in most of them a limited portion of populations has been analyzed, thus their conclusions cannot be generalized.^{4,7} In almost all of these studies, only the analysis of the site of major relevance of sweating is verified, not considering other possible associated sweating sites.

Park *et al.*, in 2010, at the HH Center at Ajou University Hospital in South Korea, found that most patients had HH in two or more sites and were the first group to analyze not only the main site, but all the sites of each patient, observing a prevalence of 32.2% of palmoplantar HH and 22.4% of axillary-palmoplantar HH.⁸

Bragança *et al.*, in 2014, studying the relationship between anxiety and depression in individuals with HH, observed that, of 197 HH patients who sought treatment at a specialized outpatient clinic in the city of Aracaju, the majority (78.1%) presented HH in more than one site.⁹

Considering the small number of articles and analyzing the distributions of HH, the present research aims, in an unprecedented manner in Brazil, to analyze the different presentations of HH (all HH sites) in a large number of patients (1,278) with HH, considering all HH sites of individuals who sought assistance in a specialized outpatient clinic for treatment of HH in a period of seven years.

METHODS

A retrospective analysis of 1,278 HH patients was conducted in an outpatient clinic specialized in the treatment of HH from August 2007 to July 2014. This study was approved by the institution's Research Ethics Committee.

Patients were divided into four groups, based on the main site of HH (point of greatest interference defined by the patient):

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palmar, when the main complaint was HH in the palms of the hands; plantar, when on the feet; axillary when in armpits; and facial when on the face.

For each group, gender, age at first visit, age at first disease manifestation, body mass index (BMI), previous treatments, number of secondary points of HH, and associations between these points were analyzed.

Within each group, two subgroups were analyzed more closely. The first, patients who had a single site of sweating in addition to the main one (total of two sites), and the second, patients who had two other sites of sweating in addition to the main one (total of three sites).

Associations between sweating sites most frequently found were listed in the tables.

Statistical analyzes

Descriptive Analysis

Descriptive analyzes for the quantitative data were performed presenting medians (for age and BMI) and arithmetic means (for other data) accompanied by the respective percentiles. Qualitative variables were presented in frequency tables.

Inferential Analysis

Kruskal-Wallis test was used for the following variables: age and BMI. Chi-square test was used for the proportions of gender and onset phase.

A probability of error of type I (α) of 0.05 was considered in all inferential analyzes.

SPSS program, version 17, was used for statistical analysis.

RESULTS

The demographic data of patients are presented in table 1. Analyzing the main complaints within each gender, we ob-

served that, in both genders, the most prevalent complaints were palmar HH (48.0% in both genders) and axillary HH (36.2% in women and 36.6% in men), which appear in similar frequencies. Analyzing genders within the main complaints, it is observed that, regardless of the main complaint, women have a higher prevalence of cases in relation to men.

We found that the majority of HH cases occur in individuals with a median age of less than 30 years, with the exception of facial HH, which appears in individuals with a mean age of 42 years.

Comparing medians of age among the four groups, there was no significant difference between the medians of age between the axillary and plantar main complaint groups ($p = 0.49$). The other groups presented significant difference ($p = 0.001$).

It is also observed the predominance of a normal BMI in patients with HH, with the exception of patients with facial HH who have a high BMI (29.0). In addition, all groups presented different mean BMI ($p = 0.001$), with the exception of the axillary and plantar groups, which presented a similar mean BMI ($p = 0.43$).

Most patients with axillary, plantar and facial HH have a greater tendency to present the first manifestation of the disease in childhood, whereas patients with palmar HH present the first manifestation in the period of adolescence.

Ratio of number of complaints presented by patients beyond the relationship between the main site of sweating and the amount of other complaints reported by the patients are shown in table 2.

Most of patients reported mainly two (35.2%) or three (32.9%) sweating sites. Only 15% of patients presented a single site of excessive sweating.

It can be observed that palmar and axillary HH constitute most of reported main complaints (48.1% and 36.1%, respectively). We observed that patients whose main complaint was palmar or

TABLE 1: Demographic data of patients

		Plantar	Facial	Axillary	Palmar	Total	P value
Men		12 (14.4%)	52 (44.0%)	149 (32.2%)	197 (32.0%)	410	0.001
Women		71 (85.6%)	66 (56.0%)	313 (67.8%)	418 (68.0%)	868	
Age range	Less than or equal to 25 years	37 (44.5%)	15 (12.7%)	185 (40.0%)	401 (65.2%)	638	
	Between 25 and 50 years	41 (49.3%)	68 (57.6%)	263 (56.9%)	207 (33.6%)	579	
	Greater than or equal to 50 years	5 (1.0%)	35 (29.6%)	14 (3.0%)	7 (1.1%)	61	
Median age		26 (19-32)	42 (31-52)	27 (21-34)	22 (16-29)		0.001
Body mass index (BMI)	Less than 18.5	6 (7.2%)	0	26 (5.6%)	65 (10.5%)	97	
	Between 18.5 and 24.9	45 (54.2%)	21 (17.7%)	291 (62.9%)	398 (64.7%)	755	
	Greater than 24.9	32 (38.5%)	97 (82.2%)	145 (31.3%)	152 (24.7%)	426	
Median BMI		23.5 (20.3-26.2)	28.3 (31-31.1)	23.4 (21.5-26.1)	22.4 (20-24.9)		0.001
Time of appearance	Childhood	32 (38.5%)	74 (62.7%)	383 (82.9%)	214 (34.7%)	703	0.001
	Adolescence	24 (28.9%)	31 (26.2%)	74 (16.0%)	350 (56.9%)	479	
	Adulthood	27 (32.5%)	13 (11.0%)	5 (1.0%)	51 (8.2%)	96	

Chi-Square; Kruskal-Wallis

TABLE 2: Number of complaints associated with main complaints in each group

Number of other complaints	Main complaint				Total
	Palmar	Axillary	Facial	Plantar	
1	11 (1.7%)	140 (30.3%)	31 (26.2%)	10 (12.0%)	192 (15.0%)
2	286 (46.5%)	106 (22.9%)	24 (20.3%)	34 (40.9%)	450 (35.2%)
3	225 (36.6%)	138 (29.8%)	32 (27.1%)	26 (31.3%)	421 (32.9%)
4	73 (11.9%)	44 (9.5%)	20 (16.9%)	8 (9.6%)	145 (11.3%)
5	20 (3.3%)	19 (4.1%)	4 (2.5%)	1 (1.2%)	44 (3.4%)
6 or +	0	15 (3.2%)	7 (5.9%)	4 (4.8%)	26(2%)
Total Partial	615 (48.1%)	462 (36.1%)	118 (9.2%)	83 (6.5%)	1278 (100.0%)

TABLE 3: Analysis of the relations between primary and secondary complaints of patients with two sites of sweating

Secondary complaint	Main complaint				Total
	Palmar	Axillary	Facial	Plantar	
Palmar	//	38 (8.4%)	5 (1.1%)	30 (6.6%)	73 (16.2%)
Axillary	5 (1.1%)	//	10 (2.2%)	1 (0.2%)	16 (3.5%)
Facial	1 (0.2%)	20 (4.4%)	//	1 (0.2%)	22 (4.8%)
Plantar	279 (62.0%)	24 (5.3%)	0	//	303 (67.3%)
Others	1 (0.2%)	24 (5.3%)	9 (2.0%)	2 (0.4%)	36 (8.0%)
Total	286 (63.5%)	106 (23.5%)	24 (5.3%)	34 (7.5%)	450

TABLE 4: List of combinations of sweating sites among patients with three complaints

Combination	Frequency
palmar/plantar/ axillary	192 (55.5%)
axillary /palmar/plantar	88 (25.4%)
plantar/palmar/ axillary	18 (5.2%)
palmar/plantar/facial	12 (3.4%)
facial/back/chest	10 (2.9%)
axillary /palmar/facial	8 (2.3%)
facial/palmar/ axillary	6 (1.7%)
axillary /back/facial	5 (1.4%)
facial/back/ axillary	5 (1.4%)
plantar/palmar/facial	2 (0.5%)
Total	346

plantar HH had a greater tendency to present one to two associated sweating sites. On the other hand, patients who have as main complaint axillary or facial HH had none, one or two associated sweating sites, in addition to the main complaint.

Table 3 lists patients with only two sites of sweating: the main site and the secondary site.

Main primary complaint in this group of patients was palmar HH (63.5%), and the main secondary complaint was plantar HH (67.3%).

Palmoplantar complaint was the most frequent (62.0%), followed by axillary-palmar (8.4%) and plantar-palmar (6.6%).

Of the 421 patients with three complaints, we found that 10 main combinations stood out, being present in 346 patients (82.0%). Table 4 lists these 10 main combinations.

The majority of patients complaining at three sites (32.9%) have two more frequent manifestations (80.9%): palmar + plantar + axillary combination (55.5%) and axillary + palmar + plantar combination (25.4%).

DISCUSSION

From previous studies, it is observed that HH is a very frequent disease. Prevalence found in these studies range from 0.6% to 16.3%.

In Brazil, only three epidemiological studies on HH were conducted.

Felini *et al.*, in 2009, studied the prevalence of HH among 500 individuals randomly selected in the city of Blumenau.¹⁰ They verified, based on the answers of a questionnaire responded by the interviewees, a prevalence of 9.0% for HH.

Westphal *et al.*, in 2011, studied the incidence of HH among 293 students of the Faculty of Medicine of the Universidade Federal do Amazonas (UFAM), in which a prevalence of 5.5% was found.¹¹

Lima *et al.*, in 2015, studied the incidence of HH among 831 medical students in Sergipe, with a prevalence of 14.7%.¹²

In view of this high prevalence of the disease and the availability of effective therapeutic alternatives in recent years, we have observed an increase in the demand for treatments in specialized outpatient clinics. In the outpatient clinic of the Clinics Hospital of FMUSP, approximately five new patients are treated weekly.

There are two main treatments for HH. The first is thoracic sympathectomy, a low risk surgery with high success rate, but that generates compensatory HH in almost all patients to a greater or lesser degree.^{1,13} The second one is drug therapy with oxybutynin hydrochloride, an antimuscarinic drug that has been shown to be a good treatment alternative for HH in all its manifestations.¹⁴ Stud-

ies have shown that patients who receive oxybutynin as a form of treatment have improved quality of life both in the short and in the long term in all major sites (palmar, facial, plantar and axillary) and also in unusual places (such as back and inguinal regions).¹⁵⁻¹⁹ Its main adverse event is dry mouth, an uncomfortable event that rarely leads the patient to abandon the treatment. Besides these two alternatives, it is also worth mentioning topical dermatological treatments and the use of botulinum toxin.¹⁴

Similarly, in literature, we observed that more than twice as many women seek treatment in our outpatient clinic compared with men. This is explained by the greater aesthetic social pressure suffered by female patients, which leads them to seek specialized help sooner and more frequently.²⁰ Even so, when it comes to the patient's gender, there is no difference in the effectiveness of the main treatments.^{20,21}

Regarding the age group, the majority of HH cases occur in younger individuals (20 to 30 years old), with the exception of facial HH, which affects individuals with a mean age over 40 years. Analyzing the age spectrum of the patients treated at the outpatient clinic, we verified that patients with palmar HH are below 25 years of age, while patients with other HH manifestations are between 25 and 50 years of age.

When analyzing the time of onset of HH in these individuals, we found that axillary, plantar and facial HH had their onset during childhood, whereas palmar HH appeared for the first time in adolescence.

Age of patient does not interfere either in the indication or in the results of the different types of treatment, having good results in children and also in individuals over 40 years.^{17,22-24}

Patients with palmar, axillary and plantar HH have normal BMI, whereas more than 80% of patients with facial HH have a BMI greater than 25. Surgical treatment is contraindicated in individuals with a BMI greater than 25 due to the increased risk of severe compensatory HH; however, high BMI does not affect drug treatment with oxybutynin hydrochloride.^{11,25,26,27}

Similarly to Park *et al.*⁸ and Bragança *et al.*,⁹ we found that most patients had more than one HH site (85%). We observed that

68.1% of the patients analyzed had one to two HH sites, in addition to the site of main sweating.

Among patients with two HH sites, the palmar + plantar combination is the most frequently reported (62.0%), followed by axillary + palmar (8.4%) and plantar + palmar (6.6%) combination.

In patients presenting three HH sites, there is a huge variety of possible combinations. In our study, we related the 10 most frequently encountered combinations, which in turn represent 82% of the total of these alterations, among them, the most common were palmar + plantar + axillary (55.5%) and axillary + palmar + plantar (25.4%).

This whole range of different forms of presentation of the disease demonstrates that when studying or treating HH, one should not only think of sweating site, as most of the studies published so far have done. It should be borne in mind that the disease manifests itself in more than one site, with different intensities in each of them and in all its presentations, generating a significant impairment of patients' quality of life.

In a patient with HH only in the hands, surgical treatment by sympathectomy with resection of the fourth thoracic ganglion is considered a great alternative; however, if the patient has palmar and facial HH, management should be resection of the second thoracic ganglion, which greatly increases the risk of severe compensatory hyperhidrosis. In cases where the patient has more than four sites of sweating, surgical treatment will probably also generate a greater chance of compensatory hyperhidrosis. Thus, it is important, for treatment selection, to assess the actual combination of patient sweating sites, rather than just the location of the primary complaint.

CONCLUSION

HH manifests itself more frequently in more than one site, and the main complaint that most affects the patients is the palmar, which appears already in the adolescence.

When there are two sweating sites, the most frequent combination is palmar + plantar, and when there are three sites of sweating, the most frequent combinations are: palmar + plantar + axillary and axillary + palmar + plantar. □

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