

Article Original

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Inframammary hyperhidrosis: clinical and gravimetric characterization

Hiperidrose inframamária: caracterização clínica e gravimétrica

ABSTRACT

Introduction: Hyperhidrosis is characterized by excessive, generalized, or focal sweating. The idiopathic or primary forms are usually focal. The inframammary location is atypical, being underreported. The severity of hyperhidrosis is evaluated through objective methods (gravimetry) or measures of impact on the quality of life (Hyperhidrosis Disease Severity Scale).

Objectives: To characterize inframammary hyperhidrosis regarding its prevalence associated factors, impact on quality of life, and gravimetry.

Methods: An observational, descriptive, and transversal study was carried out, in which all patients seen during a certain week were asked about the presence of excessive inframammary sweating. Those who answered positively were administered a questionnaire, were assessed according to the severity scale, and underwent gravimetry. The data were analyzed using descriptive statistics and chi-square test (χ^2).

Results: A total of 678 patients were seen, of whom 39 (5.7%) confirmed the complaint of inframammary hyperhidrosis. Statistical association between the gravimetry's result and body mass index was detected.

Conclusions: The prevalence of inframammary hyperhidrosis was demonstrated as an important location for primary focal inframammary hyperhidrosis. The characterization of inframammary hyperhidrosis—up until now a condition that has been little studied—can serve as a basis for future studies on therapeutic options that could improve patients' quality of life.

Keywords: hyperhidrosis; gravimetry; sweating.

RESUMO

Introdução: A hiperidrose é caracterizada por sudorese excessiva, generalizada ou focal. As formas primárias ou idiopáticas são geralmente focais. A localização inframamária é atípica, sendo pouco citada. A severidade da hiperidrose é avaliada por métodos objetivos (gravimetria) ou de impacto na qualidade de vida (Hyperhidrosis Disease Severity Scale).

Objetivos: Caracterizar a hiperidrose inframamária quanto à prevalência, fatores associados, impacto na qualidade de vida e gravimetria.

Métodos: Estudo observacional, descritivo e transversal, em que todos os pacientes atendidos durante uma semana foram questionados sobre a presença de sudorese excessiva inframamária. Aqueles que responderam positivamente preencheram questionário, escala de gravidade e submeteram-se à gravimetria. Os dados foram analisados por estatística descritiva e testes de qui-quadrado (χ^2).

Resultados: Foram atendidos 678 pacientes dos quais 39 (5,7%) confirmaram a queixa de HH inframamária. Associação estatística entre resultado da gravimetria e índice de massa corpórea foi encontrada.

Conclusões: A prevalência da HH inframamária foi demonstrada como importante localização de HH focal primária. A caracterização da HH inframamária, condição pouco estudada até agora, pode servir de base para estudos futuros, sobre opções terapêuticas que possam melhorar a qualidade de vida dos pacientes.

Palavras-chave: hiperidrose; sudorese; gravimetria.

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Hyperhidrosis is a condition characterized by excessive, generalized, or focal sweating. Generalized hyperhidrosis involves the entire body and is usually associated with systemic problems such as endocrine or neurological disorders, or infections. The primary or idiopathic focal form affects healthy people, being more frequent in the palmoplantar region, axillae, and face.¹ The pathophysiology is not completely known, and is attributed to a dysfunction of the sympathetic nervous system.²

The diagnosis is carried out clinically, based on history and physical examination. The severity of hyperhidrosis is evaluated through objective (quantitative) or subjective measurements.¹ Among the objective measurements, gravimetry—which quantifies the sweating weight (milligrams) per time unit (minutes)—is the more frequently described in the literature.³

Subjective evaluations are used to estimate the impact of the condition on the quality of life of patients, as well as the degree of severity. Since this condition can result in substantial hardship to the patient, subjective assessments of severity are important, including limitations to work, social interaction, physical activities and leisure, as well as psychological and social relationship disorders. The Hyperhidrosis Disease Severity Scale (HDSS) is specific for hyperhidrosis and measures its interference in individual patient's daily activities.⁴

The prevalence of focal hyperhidrosis is variable. In Brazil, epidemiological studies found a prevalence of 9% in the city of Blumenau, in the Southern State of Santa Catarina⁵ and 5.5% among medical students in the city of Manaus, in the Northern State of Amazonas.⁶ Yet there are few reports of cases in the inframammary region, with references in two previous studies, serving only to exemplify this body site as a region of unusual focal sweating.^{7,8}

The present study was aimed at characterizing inframammary hyperhidrosis in regards to its prevalence, associated factors, impact on quality of life, and gravimetry in patients treated at the Dermatology Clinic of the Hospital do Servidor Público Municipal de São Paulo.

METHODS

A cross-sectional, observational descriptive study was carried out. All patients were treated at the Dermatology Clinic of the Hospital do Servidor Público Municipal de São Paulo (SP), Brazil. During the course of a week they were questioned about the presence of excessive inframammary sweating. Those who answered positively were asked to complete a clinical questionnaire (Chart 1) and fill in an adapted severity scale based on the HDSS (Chart 2).

The criteria for inclusion of patients in the study were: 14 years of age or older, complaints of excessive inframammary sweating, and signing of the Free and Informed Term of Consent (FITC). Patients under 18 years of age who met the inclusion criteria could only take part in the study when accompanied by their legal representatives, who signed the FITC.

Exclusion criteria were the following: pregnancy, breastfeeding, children under the age of 14, and the refusal to take part

CHART 1: Clinical evaluation questionnaire

Inframammary hyperhidrosis			
1. Personal data			
Name:	MR (medical record):	Age:	Gender:
Ethnicity:	Weight:	Height:	Telephone:
Bra size:	Occupation:	Age of onset of symptoms:	
Family history:			
<input type="checkbox"/> No <input type="checkbox"/> Does not know		<input type="checkbox"/> Yes. kinship:	
2. Evaluation of Hyperhidrosis			
2.1. Aggravating factors:			
Anxiety	Physical exercise	Heat	Stress
Sleeping pattern	Clothing (Which?)	Food (Which?)	
Other:		<input type="checkbox"/> There is no correlation <input type="checkbox"/> Does not know	
2.2. Other body sites where focal hyperhidrosis occurs:			
<input type="checkbox"/> No <input type="checkbox"/> Yes (Which?)		Current	Previous
2.3. Previous treatment of hyperhidrosis:			
<input type="checkbox"/> No <input type="checkbox"/> Yes (Which?)			
2.4. Comorbidities:		<input type="checkbox"/> No <input type="checkbox"/> Yes (Which?)	
2.5. Regular use of medicaments:			
<input type="checkbox"/> No <input type="checkbox"/> Yes (Which?)			
3. Severity scale of Hyperhidrosis			
1 - I never notice my sweat and it never interferes with my daily activities;			
2 - My sweat is tolerable, but sometimes interferes with my daily activities;			
3 - My sweat is barely tolerable and frequently interferes with my daily activities;			
4 - My sweat is intolerable and always interferes with my daily activities.			



CHART 2: Severity scale

Grade 1	The sweat from my armpits is never noticed and never interferes with my daily activities
Grade 2	The sweat from my armpits is tolerable, but sometimes interferes with my daily activities
Grade 3	The sweat from my armpits is almost intolerable and frequently interferes with my daily activities
Grade 4	The sweat from my armpits is intolerable and always interferes with my daily activities

Adapted source: Solish N, 2007.¹

in the study. All patients were properly informed about the voluntary nature of their participation, and the absence of any financial cost or incentive arising from their participation.

A questionnaire about personal data was applied (ID information, family history, improvement and/or worsening factors, comorbidities, use of medication, age when symptoms arose, and

other areas of focal hyperhidrosis, which is part of the clinical evaluation of hyperhidrosis already standardized in other studies).⁹

The subjective evaluation of the impact of inframammary hyperhidrosis on the quality of life was carried out by the patients themselves, based on the graduation used in the HDSS scale.⁴

During the gravimetry analysis (Figure 2) all tests were performed in the same room under the same temperature range (25 to 29°C), gauged with a model Cool23CTA40 thermometer (Incoterm®, PortoAlegre (RS), Brazil).

Moisture in the inframammary region was removed with absorbent paper prior to performing the gravimetry test in order to avoid interference with the measurement of sweating. Paper filters (medium 102 paper filter, Melitta®, São Paulo (SP), Brazil) were previously weighed on a precision balance (Ohaus Precision Standard®, model TS 2KS, Metrohom, São Paulo (SP), Brazil) and then placed in the dried inframammary region. The filters were weighed again after five minutes with the difference between the two weight measurements being considered as the amount of sweat produced, in milligrams, during five minutes.

The data were analyzed through descriptive statistics and chi-square tests (X^2 tests). A greater than 95% confidence interval and a significance level less than or equal to 5% were used.

The study was approved by the Ethics Committee of the Hospital do Servidor Público Municipal de São Paulo (Protocolo 227/2011, Parecer. 15/2011).

RESULTS

During the study period, 678 patients were treated. Thirty-nine (5.7%) answered positively about excessive sweating in the inframammary region (38 women and 1 man) (Graph 1).

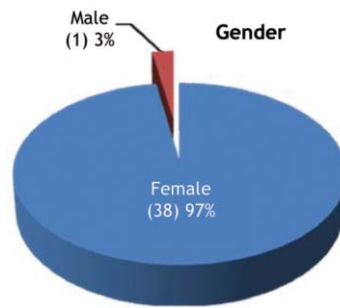
The most affected age group was that of 50-59 years-old (Graph 2), with an age of onset ranging 15-63 years.

Positive family history for hyperhidrosis (Graph 3) was observed in 41% of patients (31% uncertain, 28% denied).

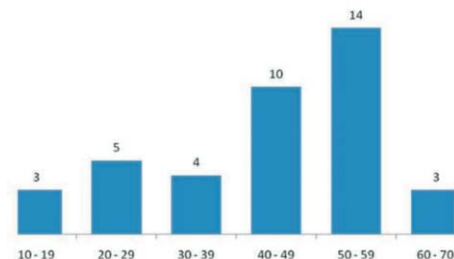
The following results were observed regarding the qualitative evaluation of severity, according to the HDSS adapted scale: Level 1: "I never notice my sweat and it never interferes with my daily activities." 6.6% of cases; Level 2: "My sweating is tolerable but sometimes interferes with my daily activities." 36.39%; Level 3: "My sweating is barely tolerable and frequently interferes with my daily activities." 27.29%; and Level 4: "My sweating is intolerable and always interferes with my daily activities." 24.26% (Graph 4).



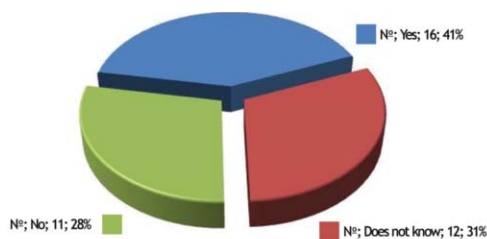
FIGURE 2: Thermometer and precision scale used in the gravimetry test



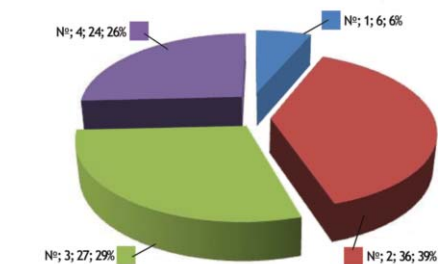
GRAPH 1:
Gender distribution



GRAPH 2:
Number of cases and prevalence of hyperhidrosis by age group



GRAPH 3:
Prevalence of family history



GRAPH 4:
Severity scale's frequency level

Aggravating associated factors were, in descending order: heat, physical exercise, mental stress, anxiety, clothing, and food. Association among hyperhidrosis factors was observed in 84.62% of cases (Table 1).

Gravimetry values ranged from zero (nil) to 330mg/5minutes. Attempts to correlate these values with other independent variables suggested no significant association between gravimetry and family history ($X^2 = 31.754$, $p = 0.2014$), bra size ($X^2 = 120.078$, $p = 0.7224$), or severity scale ($x^2 = 9.497$, $p = 0.3927$). There was statistically significant association between body mass index and gravimetric results (Table 2), both for isolated results ($X^2 = 56.456$, $p = 0.0349$) and for weight range group ($X^2 = 19.838$, $p = 0.0189$).

TABLE 1: Aggravating factors and other factors associate with inframammary focal hyperhidrosis

ASSOCIATED FACTORS	YES		NO		NOT REPORTED		TOTAL PATIENTS
	Nº	%	Nº	%	Nº	%	
Anxiety	20	51,28	18	46,15	1	2,56	39
Physical exercise	30	76,92	8	20,51	1	2,56	39
Heat	38	97,44	1	2,56	-	-	39
Food	5	12,82	33	84,62	1	2,56	39
Stress	22	56,41	17	43,59	-	-	39
Other body sites where hyperhidrosis occurs	19	48,72	19	48,72	1	2,56	39
	33	84,62	6	15,38	-	-	39

TABLE 2: Association between the Gravimetric and the Body Mass Indices

GRAVIMETRY MG/5MIN	NORMAL	OVERWEIGHT	GRADE I OBESITY	GRADE II OBESITY	GRAND TOTAL
0 - 50	9	16	4	1	30
60 - 100	-	1	-	1	2
110 - 150	1	-	2	-	3
>150	1	1	-	2	4
GRAND TOTAL	11	18	6	4	39

DISCUSSION

Although previous studies carried out in Brazil have estimated the frequency of focal hyperhidrosis according to the body site where it occurs, the prevalence and characterization of inframammary hyperhidrosis was first described in the present study.

The age group¹⁰ and positive family history¹¹ were in line with the literature's data for other focal hiperidroses—in the U.S. population there was a higher prevalence in the 45–55 year-old age group and 47.5% frequency in patients with a family history.

Statistical association found between gravimetry and body mass index corroborates the hypothesis that the degree of obesity is reflected in the body surface area and density of sweat glands, being also observed in other areas of focal hyperhidrosis.

Body mass index was recently evaluated in patients in Brazil with facial hyperhidrosis, with an absence of results that indicated correlation.¹² Though not based on statistical data, a positive relationship between obesity and primary hyperhidrosis was nonetheless observed in a Brazilian study carried out with medical students in the city of Manaus, in the northern State of Amazonas.

Other features of inframammary hyperhidrosis were similar to those observed in studies focusing on diverse body sites. The frequency observed in the severity scale was similar to that observed in the pioneering study that standardized such a scale,¹³ with a higher prevalence in Level 2: “My sweating is tolerable, but sometimes interferes with my daily activities.”, and Level 3: “My sweating is barely tolerable and frequently interferes with my daily activities.”.

Aggravating and/or other factors associated with inframammary hyperhidrosis were similar to those found in previous studies that focused on other body sites where focal hyperhidrosis typically occurs, and where a greater association with heat, stress, anxiety, and physical exercise was observed in epidemiological surveys in the U.S. and Canadian populations.¹¹

The coexistence of inframammary hyperhidrosis with other affected body sites was also reported by the patients (84.62%), and is consistent with the association between different areas of focal hyperhidrosis already described in the literature.¹⁰

CONCLUSION

The prevalence of inframammary hyperhidrosis—a condition that has been little studied to date—demonstrates its importance as a primary and focal variant of hyperhidrosis.

The use of gravimetry and a severity scale were instrumental in evaluating inframammary sudoresis. The degrees of severity showed that sudoresis exerts a frequent and important impact on the quality of life of patients and can be approached therapeutically. Therefore, there is consensus that it should be seen as an abnormality.

The methodology used in this study was similar to that employed in studies aimed at characterizing other forms of focal hyperhidrosis 5,6,13 and can serve as a base for future studies on therapeutic options that can be used to improve patients' quality of life. ●

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