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Abdominal hysterectomy and impaired physical function in Colombian older women.

Histerectomía abdominal y deterioro de la función física en mujeres adultas mayores colombianas

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Abstract

OBJECTIVE: To estimate the association of abdominal hysterectomy with impaired physical function and limitation of daily living activities in elderly Colombian women.

MATERIALS AND METHODS: Cross-sectional study in Colombian women aged 60-75 years who signed a statement of informed consent, allowed anthropometric measurements, and completed a survey with questions on socio-demographic and clinical data. The physical function subscale of the SF-36 questionnaire was used. Bivariate logistic regressions were performed: limitation of usual activities or impairment of physical function (dependent variables), with history of hysterectomy, with or without oophorectomy in pre- or postmenopause (independent variables). Four adjusted logistic regression models were also used.

RESULTS: Seven hundred women with a mean age of 67.0 ± 4.8 years and 18.9 ± 6.3 years since onset of menopause were evaluated. All had undergone hysterectomy in the following proportions, hysterectomy with oophorectomy in the premenopausal years (4.2 %); hysterectomy without oophorectomy in the premenopausal years (18.1%); hysterectomy with oophorectomy in the postmenopausal years (2.1%); and hysterectomy without oophorectomy in the postmenopausal years (8.4%). Hysterectomy with or without oophorectomy in premenopause was associated with impaired physical function (MR: 2.67; 95%CI: 1.19-5.97), and 2.02 (95%CI: 1.34-3.09), respectively. The same was true for daily activities ($p < 0.05$). Postmenopausal hysterectomy with ovarian preservation or removal was not associated with impaired physical function ($p > 0.05$).

CONCLUSION: An association was found between hysterectomy, and limitation of daily activities and impaired physical function in the studied sample. Hysterectomy with or without oophorectomy in the premenopausal years, as opposed to early postmenopausal hysterectomy, was significantly associated with physical function impairment.

KEYWORDS: Hysterectomy; Ovariectomy ; Quality of life; Activities of Daily Living; Motor Activity.

Resumen

OBJETIVO: Estimar, en mujeres adultas mayores colombianas, la asociación entre histerectomía abdominal con el deterioro de la función física y con la limitación para las actividades de la vida diaria.

MATERIALES Y MÉTODOS: Estudio transversal llevado a cabo en mujeres colombianas entre 60 y 75 años que firmaron el consentimiento informado, permitieron mediciones antropométricas y contestaron un formulario con preguntas acerca de datos sociodemográficos y clínicos. Se aplicó la subescala de función física del Cuestionario SF-36. Se realizaron regresiones logísticas bivariadas: limitación para las actividades habituales o deterioro en la función física (variables dependientes) con el antecedente de histerectomía con o sin ooforectomía en la pre o posmenopausia (variables independientes). Además, se aplicaron cuatro modelos de regresión logística ajustada.

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RESULTADOS: Se evaluaron 700 mujeres con promedio de edad de 67.0 ± 4.8 años y 18.9 ± 6.3 años trascurridos a partir de la menopausia. A todas se les practicó histerectomía con ooforectomía durante los años de premenopausia (4.2%); histerectomía sin ooforectomía en la premenopausia (18.1%); histerectomía con ooforectomía en la posmenopausia (2.1%) e histerectomía sin ooforectomía en la posmenopausia (8.4). La histerectomía con ooforectomía, o sin esta última en la premenopausia, se relacionó con deterioro de la función física (RM: 2.67; IC95%:1.19-5.97) y 2.02 (IC95%:1.34-3.09). Igual sucedió con las actividades habituales ($p < 0.05$). La histerectomía con preservación o extirpación ovárica durante la posmenopausia no se asoció con deterioro de la función física ($p > 0.05$).

CONCLUSIÓN: En la muestra estudiada se encontró relación entre la histerectomía con limitación para actividades diarias y con deterioro de la función física. La histerectomía con o sin ooforectomía practicada durante los años de premenopausia, a diferencia de la adelantada en posmenopausia, se asoció, significativamente, con deterioro del funcionamiento físico.

PALABRAS CLAVE: Histerectomía; ovariectomía; calidad de vida; actividades de la vida diaria; actividad motora.

BACKGROUND

One of the most practiced surgeries on women is hysterectomy, whether abdominal or vaginal, complete or partial, with ovarian preservation or removal, and before or after menopause.[1-7] Hysterectomy can be laparoscopic, robotic, or by laparotomy. It is the most frequent gynecologic surgery in the United States, China, and Taiwan, with year-person rates of 5.8 x 100, 1.1 x 100, and 3.0 x 100, respectively.[6-11]

Hysterectomy with bilateral oophorectomy, before the natural withdrawal of menstruation, causes alterations in the hypothalamus-hypophysis-ovary (surgical menopause).[2-6,12] This triggers menopause symptoms, genitourinary syndrome and sexual impairment. Surgical menopause is associated with dementia, cognitive impairment, obesity, hyperlipidemia, arterial hypertension, cardiovascular disease, metabolic syndrome, atherosclerosis, 50% increase of the risk of osteoporosis fracture, twofold increase of mortality after hip fracture, Parkinson's disease risk, and sarcopenic obesity.[2,3,11-16] There are 400,000 hysterectomies with bilateral oophorectomy reported in the United States every year.[10] Hysterectomy without oophorectomy in premenopause alters ovarian circulation and eliminates endocrine and paracrine signals, it accelerates follicular depletion, and it leads to early or premature menopause.[13,17,18]

Hysterectomy is indicated when there are uterine, endometrial, ovarian, and cervical lesions.[1,2,5,7,8,9] Stang et al.[5] report that 81.4% of hysterectomies performed in Germany are due to benign diseases, such as myomas, endometriosis, hemorrhages, pain, and adnexal masses. All the aforementioned have an impact on health and quality of life.[3,4,6,7,9] However, despite the efficacy of hysterectomy, urogenital, psychological and somatic effects appear with time, because of the vaginal shortening, lower amount of ovarian hormones, and individual psychological factors.[1,4,7] Hysterectomy has been associated with adverse effects on mental health, and an increase in the risk of mortality because of different diseases.[1,2,3,13,16,17,18]

There are few studies that evaluate the repercussion of hysterectomy on physical function and the capability to do daily activities. Because of this, the objective of the study was to assess the association between abdominal hysterectomy, and physical function and a limitation in daily activities in older women.

MATERIALS AND METHODS

Cross-sectional study which is part of the SARCOL (sarcopenia in Colombian women) research project, approved by the Ethics Committee of the Cartagena University, in Colombia, number 02062-2019. The verification list of the STROBE initiative was taken into account.[20]

Inclusion criteria: Women between 60 and 74 years who had daily life activities and lived in the Bolivar department (Caribbean region), or in the Santander department (oriental region). *Exclusion criteria*: Women who did not wish to participate, with cognitive impairment, reading-writing deficiencies, visual impairment, lower extremity edema, severe heart or renal failure, oncologic disease, gait disturbance, or anthropometric measurement inability. *Elimination criteria*: Women who did not understand how to answer the questionnaire, and women who were treated at home. The participants signed a statement of informed consent, participated in the anthropometric measurements, answered the sociodemographic and clinical questionnaire, and also answered the physical function subscale of the SF-36 Health questionnaire. Finally, they received information about aging.

Measurements: Body weight (Kg) was measured with a scale, and height was measured with a stadiometer, without shoes. This data allowed the calculation of body mass index (BMI; kg/m^2) and the establishment of their nutritional state: low weight, normal weight, overweight, and obesity.[21] Abdominal, hip, and calf circumference were measured with measuring tape (cm) at the height of the navel, anterior superior iliac crest, and calf, respectively. Abdominal obesity was defined as an abdominal circumference ≥ 89 cm, android obesity as a waist-hip ratio ≥ 0.85, and reduced muscle mass as a calf circumference ≤ 31.0 cm.[22,23,24] To establish muscular strength, three measurements of the dominant hand grip were made with a Trailite dynamometer (LiteXpress GmbH, Coesfeld, Germany), with one-minute intervals while the participant was seated, with the shoulder in adduction, elbow flexed at 90 degrees, and forearm and wrist in neutral position. The average grip strength under 16.0 kg was considered diminished muscular strength.[25] Also, walking speed (meters per second) was calculated with a stopwatch while the participant walked a previously-marked four-meter distance, at her own pace. Two measurements at an interval of 3 minutes were taken. A walking speed under 0.8 m per second was considered low physical performance.[24,25]

To establish a limitation in daily activities and an impairment in physical function, the physical function subscale SF-36 was used. This is a widely used tool to explore health, well-being, and quality of life. This tool has an adequate reliability, validity, and sensibility in diverse populations, and it is available in several languages, so the Spanish version was used.[26,27,28] The SF-36 covers 8 dominions, included the physical function subscale (items 3a-3j), which ask about the limitation to make intense, moderate, or vigorous efforts, carry grocery bags, climb stairs, bend or kneel, and walk long, moderate, or short courses. Answers are given 1 point (yes, it's very limiting), 2 (yes, somewhat limiting), or 3 (no, it doesn't limit me at all). For the two-tail analysis, the first two options were grouped with the term "limitation". The total sum of the items results in the total subscale score, ranging from 10 to 30. There are no cutoff points established, but the lower the score, the worse the physical function is. For the present study, if an individual's average score was below the mean, it suggested impairment

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in physical function. A Cronbach alpha of 0.90 was found in the population of the study. Four types of hysterectomy were defined as hysterectomy history: surgical menopause (hysterectomy with bilateral oophorectomy in premenopause), premenopause hysterectomy (hysterectomy without bilateral oophorectomy in premenopause), hysterectomy with bilateral oophorectomy in postmenopause, and hysterectomy with bilateral oophorectomy in postmenopause.

The questionnaires were filled until there were no more left, and the answered ones remained in custody. Those which were answered correctly were numbered and captured to an Excel database. Incomplete questionnaires were not considered for the analysis.

The sample size was calculated with the OpenEpi software, with data from the Population Colombian Census 2018, which projected for 2019 a total of 25,271,995 women, out of which 17.1% were between 60 and 74 years of age. The census also informed that 2,215,932 women lived in the Bolivar and Santander departments, and 378,932 were between 60 and 74 years.[29] The sample size was calculated at 385 women, with a confidence interval of 95%, 50% heterogeneity, and a 5% margin of error. One hundred women (26.0%) were added to replace those who answered the questionnaires incompletely. Also, as a precaution against document loss, 275 (56.7%) women from distant municipalities were added. Seven hundred and sixty questionnaires were printed and distributed by convenience in the selected populations.

The statistical analysis was made with the EPI-INFO-7 software. The continuous variables were expressed as means and standard deviation, and the categorical variables as absolute and relative values, with a CI of 95%. The significance of the differences between the continuous variables was calculated with Anova or Mantel-Haenzel test, according to the variance analysis made with Bartlett's test. The differences among the qualitative data were established with the chi-squared test. The logistic regression was bivariate, with the calculation of odds ratio and confidence intervals of 95% (CI95%), including the ten activities explored by the subscale, and the impairment of physical function (dependent variable) with the four types of hysterectomy history (independent variable). Lastly, four models of logistic regression were made which included physical function, nutritional condition, postmenopause condition, abdominal and androgenic obesity, occupation out of home, muscle mass, muscle strength, physical performance, and the four types of hysterectomy. The goodness of fit was calculated using Likelihood Ratio , and a value of $p < 0.05$ was considered statistically significant.

The participants were informed about the goal of the study, and they participated voluntarily. No identification information was required, only the signature of informed consent. There were no incentives offered, and the participants could withdraw from the study at any moment. General information was offered to promote physical and general health. The Helsinki Declaration, and the ethical principles of the Belmont Report were considered for the study, as well as what's established in Resolution 8430-1993 by the Health Ministry of the Republic of Colombia, which classifies the present study as minimal risk.

RESULTS

Eight hundred and seventy-four women were invited to answer the questionnaires; 114 (13.0%) showed exclusion criteria. Among the 760 remaining questionnaires, 60 (7.8%) were answered incorrectly so they were ruled out. The study was made with the information of 700 women, 81.8% above the sample size estimation.

The mean age was 67.0 ± 4.8 years, and 18.9 ± 6.3 years in postmenopause. Fifty percent of

the women presented abdominal obesity, and 60% androgenic obesity. The average subscale score was 25.02 ± 5.18. Ninety percent were 11 years or more in postmenopause, 4.2% had surgical menopause, 33.0% had a history of hysterectomy, and 42.0% had physical function impairment. These last ones were older, had been longer in postmenopause, had a higher BMI, worse physical performance, lower grip strength, and there was a higher proportion of women with surgical hysterectomy and premenopause , in comparison to those without physical function impairment ($p < 0.001$). **(Table 1)** All the women reported that their hysterectomy had been by laparoscopy, none had a vaginal surgery, and 15 (2.1%) had a unilateral ovarian surgery. Forty percent reported an important limitation to make intense efforts, while 60% didn't have a limitation to carry grocery bags, climb stairs, or walk long courses. **(Table 2)** The most frequent limitations were intense efforts, bending over, and moderate efforts. **Figure 1**

When the hysterectomy was performed during the premenopause years, significant outcomes prevailed ($p < 0.05$). Surgical menopause was associated with a greater limitation to make moderate or vigorous efforts, climb stairs, and

Table 1. Sociodemographic characteristics and distribution according to physical function impairment (*) (Continued on the next page)

	All n = 700	Without physical function impairment n = 406 (58,0%)	With physical function impairment n = 294 (42,0%)	p
Age, years, X±SD	67,0±4,8	66,2±4,6	68,2±4,9	<0,001 (**)
Time of study, years, X±SD	5,8±4,7	5,8±4,8	5,7±4,6	0,64 (**)
Age at last period, years, X±SD	48,1±4,1	48,2±4,1	48,0±4,2	0,48 (**)
Time since the last period, years, X±SD	18,9±6,3	17,9±6,0	20,2±6,4	<0,001 (**)
Abdominal circumference, cm, X±SD	90,2±14,5	89,5±14,4	91,09±14,6	0,17 (**)
Hip circumference, cm, X±DS	103,6±10,9	103,3±10,5	103,9±11,5	0,48 (**)
Calf circumference, cm, X±SD	34,1±4,0	34,1±3,9	34,0±4,2	0,73 (**)
Body mass index, X±SD	26,5±4,8	25,8±4,7	27,4±4,8	<0,001 (**)
Waist/hip ratio, X±SD	0,87±0,1	0,86±0,1	0,87±0,1	0,24 (**)
Dominant hand's grip strength, kg, X±SD	16,6±6,1	17,4±6,0	15,4±6,0	<0,001 (**)
Walking speed, m/second, X±SD	0,65±0,1	0,68±0,1	0,61±0,1	<0,001 (§)
Postmenopause status, between 6-10 years, n (%) [CI95%]	69 (9,8) [7,8-12,2]	47(11,5) [8,8-15,0]	22 (7,4) [4,7-11,1]	0,07 (ǂ)
Postmenopause status, 11 years or more, n (%) [CI95%]	631 (90,1) [87,7-92,1]	359 (88,4) [84,9-91,1]	272 (92,5) [88,8-95,2]	
Overweight, (BMI: 25,00-29,99), n (%) [CI95%]	257 (36,7) [33,2-40,3]	144 (35,4) [30,9-40,2]	113 (38,4) [32,8-44,2)	0,42 (ǂ)
Obesity, (BMI:>30,00), n (%) [CI95%]	166 (23,7) [20,7-27,0]	82 (20,2) [16,5-24,3]	84 (28,5) [23,4-34,1]	0,01 (ǂ)
Abdominal obesity, (abdominal circumference ≥89 cm) n (%) [CI95%]	368 (52,5) [48,8-56,2]	205 (55,7) [45,6- 55,3]	163 (55,4) [49,5-61,2]	0,19 (ǂ)
Android obesity, (waist/hip ratio ≥0,85), n (%) [CI95%]	410 (58,5) [54,8-62,1]	240 (59,1) [54,2-63,7]	170 (57,8) [51,9-63,5]	0,73 (ǂ)

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Table 1. Sociodemographic characteristics and distribution according to physical function impairment (*) (Continuation)

	All n = 700	Without physical function impairment n = 406 (58,0%)	With physical function impairment n = 294 (42,0%)	p
Reduced muscle mass (calf circumference <31 m), n (%) [CI95%]	136 (19,4) [16,6-22,5]	76 (18,7) [15,2-22,8]	60 (20,4) 15,9-25,4]	0,57 (ǂ)
Low physical performance (walking speed <0.8 m/s), n (%) [CI95%]	583 (83,2) [80,3-85,8]	317 (78,0) [73,8-81,8]	266 (90,4) [86,5-93,5]	<0,001(ǂ)
Diminished muscle strength (dominant hand's grip strength <16 kg), n (%) [CI95%]	477 (68,1) [64,6-71,4]	261 (64,2) [59,5-68,7]	216 (73,4) [68.0-78.4]	0,01 (ǂ)
Occupation out of home, n (%) [CI95%]	46 (6,5) [4,9- 8,6]	34 (8.3) [6,0-11,4]	12 (4,0) [2,1-7,0]	<0,05 (ǂ)
Surgical menopause (hysterectomy with bilateral oophorectomy in premenopause), n (%) [CI95%]	30 (4,2) [3,0-6,0]	10 (2,4) [1,3-4,4]	20 (6,8) [4,2-10,3]	<0,01 (ǂ)
Premenopause hysterectomy (hysterectomy without bilateral oophorectomy in premenopause, n (%) [CI95%]	127 (18,1) [15,4-21,1]	55 (13,5) [10,5- 17,2]	72 (24,4) [19,6-29,8]	<0,001 (ǂ)
Hysterectomy with bilateral oophorectomy in postmenopause, n (%) [CI95%]	15 (2,1) [1,30-3,5]	6 (1,4) [0,6-3,1]	9 (3,0) [1,4-5,7]	0.15 (ǂ)
Hysterectomy without bilateral oophorectomy in postmenopause, n (%) [CI95%]	59 (8,4) [6,5-10,7]	32 (7,8) [5,6-10,9]	27 (9,1) [6,1-13,0]	0,54 (ǂ)

(*) Established with the Health Questionnaire SF-36 physical function subscale.
Spanish version of SF-36v2, Health Survey, 2000, Adapted by J Alonso and Col, 2003.
(**) Anova.
(§) Mann-Whitney.
(ǂ) Chi-squared-Mantel-Haenszel.

Table 2. Physical function assessment (*) n = 700 (Continued on the next page)

The following questions address activities or things that can be done on a normal day, and if the health condition causes limitations	No, It doesn't limit me at all	Yes, it limits me somewhat	Yes, it limits me a lot
	n (%) [CI95%]		
SF-3a Make intense or vigorous efforts such as running, lifting heavy objects, or participating in exhausting activities	249 (35,6) [32,1-39,1]	167 (23,9) [20,8-27,1]	284 (40,5) [36,9-44,2]
SF-3b Making moderate efforts such as moving a table, vacuuming, bowling, or walking for more than an hour	415 (59,3) [55,6-62,8]	150 (21,4) [18,5-24,6]	135 (19,2) [16,5-22,3]
SF-3c Carrying a medium grocery bag	447 (63,9) [60,2-67,3]	152 (21,7) [18,8-24,9]	101 (14,4) [12,0-17,2]
SF-3d Climbing several flights of stairs	421 (60,1) [56,4-63,7]	154 (22,0) [19,0-25,2]	125 (17,8) [15,2-20,8]
SF-3e Climbing one flight of stairs	475 (67,9) [64,3-71,2]	144 (20,6) [17,7-23,7]	81 (11,6) [9,4-14,1]

Table 2. Physical function assessment (*) n = 700 (Continuation)

The following questions address activities or things that can be done on a normal day, and if the health condition causes limitations	No, It doesn't limit me at all	Yes, it limits me somewhat	Yes, it limits me a lot
	n (%) [CI95%]		
SF-3f Bending over or kneeling	337 (48,1) [44,4-51,8]	173 (24,7) [21,6-28,0]	190 (27,1) [23,9-30,5]
SF-3g Walking long courses of one kilometer or more	484 (69,1) [65,6-72,4]	129 (18,4) [15,7-21,4]	87 (12,4) [10,1-15,0]
SF-3h Walking moderate courses of a few blocks or hundreds of meters	529 (75,5) [72,2-78,6]	119 (17,0) [14,4-19,9]	52 (7,4) [5,7-9,6]
SF-3i Walking short courses of a single block or about 100 meters	578 (82,5) [79,5-85,2]	87 (12,4) [10,1-15,0]	35 (5,0) [3,6-6,8]
SF-3j Showering or getting dressed by yourself	678 (96,8) [95,2-97,9]	14 (2,0) [1,2-3,3]	8 (1,1) [0,58-2,2]

(*) Established with the Health Questionnaire SF-36 physical function subscale.
Spanish version of SF-36v2, Health Survey, 2000, Adapted by J Alonso and Col, 2003.

(*) Con el término "limitación" se unieron las respuestas: "Si, me limita un poco" y " Si, me limita mucho".
Ítems de la subescala de Función Física que hace parte del Cuestionario de Salud SF-36. Versión española de SF-36v2, Healt Survey, 2000. Adaptada por J Alonso y Col, 2003.

Figure 1. Limitation to do activities that can be done on a normal day.

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walk ($p < 0.05$). A similar finding was observed in patients with premenopause hysterectomy. When hysterectomy was performed in postmenopause, with or without oophorectomy, it was only associated, significantly, with a limitation to walk. Surgical menopause, and premenopause hysterectomy were associated with a greater impairment of physical function ($p < 0.05$), while hysterectomy, with or without oophorectomy, was not. **(Table 3)** In the adjusted logistic analysis, surgical menopause with premenopause hysterectomy were associated twice with physical function impairment ($p < 0.05$). **Figure 2**

DISCUSSION

In a group of women with mean age of 64 years, 64.4% had a limitation to make vigorous efforts, 50% to bend over, and 42.0% had physical function impairment. To explain these findings, physical function and multiple health factors must be explored together with cognitive, musculoskeletal, neurovascular, and endocrine integrity. The growth hormone, the growth factor like insulin-I , estrogens, androgens, and glucocorticoids, are physical function regulators. Aging and inherent psychobiological changes also play a role.[30,31,32] The United Nations, and the WHO have stated that by the year 2050, one in five people will be at least 60.[33,34]

The present study found that the association between hysterectomy, and a limitation for daily activities and physical function impairment, was different according to the menopause state. Hysterectomy in premenopause, with or without oophorectomy, was associated with a limitation to carry out vigorous or moderate activities, condition which was not observed if the surgery was performed in postmenopause. This is an interesting finding; however, no comparisons were possible as we did not identify similar studies. Despite this, other unwanted effects of hysterectomy have been reported. The Women's Health Initiative[35] reported that hysterectomy with oophorectomy was associated with heart attack, and death due to coronary artery disease, and the risk was higher, the younger the age of oophorectomy. Hysterectomy before 45 years of age increased twofold the risk of stroke.[36,37,38] Finch et al.[16] found that physical, vasomotor, psychological, and sexual impairment were greater after oophorectomy, in comparison with presurgical evaluation. Hysterectomy has been associated with urinary incontinence and sexual problems.[39,40] Monterrosa-Castro et al.[1], reported that in women with hysterectomy, sexual impairment, and insomnia were associated with three times greater impairment in quality of life. This can be explained by the hormonal impairment caused by hysterectomy and its subsequent organic disfunction.[2,13,16,32]

While hysterectomy is efficacious to improve quality of life of women with gynecologic disorders, the number of hysterectomies made to treat benign conditions in industrialized countries, has decreased due to the option of less invasive alternatives.[2,6,8,9,11] On the other hand, the trend in low to middle income countries is high or on the rise, because of educational, socioeconomical, and geographical factors, together with a lack of unification in medical opinions about adequate indications for hysterectomy. Also, a suspicion of for-profit, unethical practices by medical suppliers is reported, when they recommend hysterectomy to young women.[8,41] Obstetrician-gynecologists and their patients must know the consequences of hysterectomy and oophorectomy when performed at an early age.[41] Even without oophorectomy, hysterectomy is associated with an early development of endocrine changes related with menopause.[2,13,17] When hysterectomies are performed in the third or fourth decade of a woman's life, they favor the onset of menopause symptoms before the time of the natural withdrawal of the period.[8,42] A meta-analysis[18] concluded that premenopause hysterectomy has a negative repercussion in the concentra-

Table 3. Association with limitations to do daily activities and physical function impairment. (*) Unadjusted logistic regression

	SF-3a	SF-3b	SF-3c	SF-3d	SF-3e	SF-3f	SF-3g	SF-3h	SF-3i	SF-3j	Physical function impairment
	OR [CI95) (p)										
Surgical menopause (Hysterectomy with bilateral oophorectomy in premenopause)	2,86 [1,08-7,57] (<0,05)	3,58 [1,61-7,95] (0,001)	1,18 [0,56-2,50] (0,65)	2,35 [1,11-4,95] (<0,05)	1,90 [0.91-3,97] (0,08)	1,63 [0,76-3,49] (0,20)	3,09 [1,47-6,48] (0,001)	3,29 [1,57-6,89] (0,001)	5,26 [2,49-11,08] (<0,001)	1,06 [0,13-8,19] (0,94)	2,89 [1,33-6,27] (<0,001)
Premenopause hysterectomy (Hysterectomy without bilateral oophorectomy in premenopause)	1,90 [1,22-2,94] (<0,01)	1,96 [1,33-2,89] (<0,001)	1,56 [1,06-2,31] (<0,05)	1,62 [1,10-2,39] (<0,05)	1,66 [1,12-2,47] (<0,05)	1,17 [0,79-1,72] (0,41)	1,87 [1,26-2,78] (0,001)	1,41 [0.92-2,16] (0,11)	1,71 [1,07-2,71] (<0,05)	0,70 [0,20-2,42] (0,57)	2,06 [1,40-3,05] (<0,001)
Hysterectomy with bilateral oophorectomy in postmenopause	2,24 [0,62-8,01] (0,21)	2,22 [0,78-6,31] (0,13)	1,18 [0,41-3,36] (0,75)	1,32 [0,47-3,70] (0,58)	1,87 [0,67-5,23] (0,23)	1,40 [0,49-3,98] (0,52)	2,61 [0.93-7,31] (0,06)	4,84 [1,69-13,80] (<0,01)	4,33 [1,54-12,11] (<0.01)	5,11 [1,08-24,11] (<0.05)	2,10 [0,74-5,98] (0,16)
Hysterectomy without bilateral oophorectomy in postmenopause	1,40 [0,77-2.51] (0,25)	1,56 [0,91-2,67] (0,10)	0,97 [0,55-1,70] (0,92)	1,51 [0,88-2,58] (0,12)	1,28 [0,73-2,23] (0,37)	1,10 [0,64-1,89] (0,70)	1,73 [1,00-2,98] (0,04)	2,49 [1,44-4,31] (0,001)	2,26 [1,25-4,10] (<0,05)	1,09 [0,24-4,78] (0,90)	1.18 [0,69-2,01] (0,54)

(*) Established with the Health Questionnaire SF-36 physical function subscale.
Spanish version of SF-36v2, Health Survey, 2000, Adapted by J Alonso and Col, 2003.
SF-3a: Limitation to make intense or vigorous efforts such as running, lifting heavy objects, or participating in exhausting activities.
SF-3b: Limitation to make moderate efforts such as moving a table, vacuuming, bowling, or walking longer than an hour.
SF-3c: Limitation to carry a medium grocery bag.
SF-3d: Limitation to climb several flights of stairs.
SF-3e: Limitation to climb one flight of stairs.
SF-3f: Limitation to bend over or kneel.
SF-3g: Limitation to walk long courses of one kilometer or more.
SF-3h: Limitation to walk moderate courses of a few blocks or hundreds of meters.
SF-3i: Limitation to walk short courses of one block or about 100 meters.
SF-3j: Limitation to shower or get dressed by oneself.

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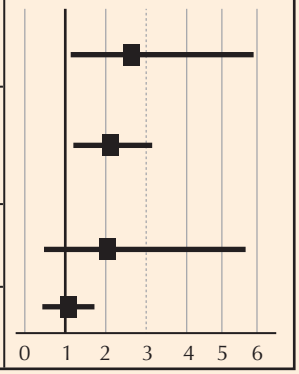
Histerectomía con ooforectomía bilateral en premenopausia (menopausia quirúrgica)	2.67 [1.19-5.97] (0.01)
Histerectomía sin ooforectomía bilateral en premenopausia (histerectomía premenopáusica)	2.02 [1.34-3.09] (<0.001)
Histerectomía con ooforectomía bilateral en posmenopausia	2.01 [0.70-5.78] (0.19)
Histerectomía sin ooforectomía bilateral en posmenopausia	1.08 [0.62-1.88] (0.76)



(*) Se incluyeron como covariables: el estado posmenopáusico y nutricional, la obesidad abdominal y androgénica. La ocupación laboral fuera de casa, la clasificación según la masa muscular, el rendimiento físico y la fuerza muscular. Datos expresados en OR[IC95%] (Valor de p). En los cuatro modelos: Likelihood Ratio: p<0.001.

Figure 2. Association of a history of hysterectomy and physical function impairment.

tions of anti-Müllerian hormone, FSH, LH, inhibin B, and ovarian function.

The study published here is, perhaps, one of the first to contribute elements of the association between hysterectomy and impairment of physical function. It also shows differences according to the state of menopause and the moment of surgery, in community settings. Another strength of the study is that it provides with reasons to avoid, whenever possible, the removal of the uterus or the ovaries. Emphasis is placed on the importance of the SF-36 to assess physical function and daily activities, and it tries to create awareness about the repercussions of hysterectomy on physical function. Undoubtedly, more studies are needed to provide more support to the findings, in coherence with the observations that show that hysterectomy has negative effects on physical and psychosocial health.[8]

Regarding the limitations of the study, the most relevant is the design of the results, as they show statistical associations, and not causality. While the number of patients was based on population data, the results are specific to the study group, hence, extrapolations must be made carefully. Another limitation is that no information was gathered about the age when hysterectomy was performed, the diagnosis made, and the anatomopathological report or hormone sample was known. This was because community access prevented it. Although selection, information and memory biases were tried to be reduced, they can be present and cause over- or underestimation.

A suggestion for doctors who treat women is the application of the physical function SF-36 subscale, to identify limitations in daily activities. General doctors, geriatricians, internists, gerontologists, and physiatrists should ask their patients with physical function impairment, about a history of hysterectomy. Medical associations should insist to obstetricians-gynecologists about balancing the positives and the negatives of hysterectomy, in the clinical aspect, as much as in the psychosocial aspect. It is also important

to remember that it is health authorities who provide with supplies for health professionals to choose good quality performance, adhering to international guidelines, exploring physical function, limitations of daily life, and promoting educational activities, so that patients stay healthy and with well-being.[19]

CONCLUSION

An association between hysterectomy, and a limitation to do daily activities and physical function was found in the studied population. Hysterectomy with or without oophorectomy performed in the years of premenopause, unlike the early one in postmenopause, was associated, significantly, with physical function impairment.

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