RESEARCH REPORT

Hysterectomy and socioeconomic position in Rome, Italy

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Study objective: There exists conflicting evidence regarding the higher risk of hysterectomy among women of a lower educational and economic level. This study aims to assess whether in Italy socioeconomic level is related to hysterectomy undertaken for different medical reasons.

Design: An area based index was used to assign socieconomic status (SES; four levels defined) to 3141 women (aged 35 years or older) who underwent a hysterectomy in 1997 and were residing in Rome. Data were taken from hospital discharge records. Direct age standardised hospitalisation rates by SES level were calculated for overall hysterectomies and for those performed for either malignant or non-malignant causes. Statistical differences were detected using the ratios of standardised rates and the test for linear trend.

Main results: The hysterectomy rate was 36.7 per 10 000 women aged 35 years or more. Hysterectomy for uterine leiomyoma accounted for 41% of all operations and was more frequent among women aged 35–49 years than for those aged 50 years or more (crude rates: 28.6 and 7.7 per 10 000, respectively). The risk of hysterectomy was 35% higher for the lowest SES group, compared with the highest group. No association was found between SES and hysterectomy rates for malignant causes, although less affluent women in age group 35–49 years had 87% higher risk of hysterectomy compared with most affluent women. The inverse association between SES and hysterectomy rates attributable to non-malignant causes was statistically significant for women aged 35–49 years but not for those aged 50 years or more.

Conclusions: The inverse relation between hysterectomy and SES is largely attributable to benign disorders of the uterus, namely leiomyoma and prolapse. More affluent women may have a greater uptake of less invasive techniques for removing uterine leiomyoma compared with less affluent women, who are more likely to undergo unnecessary hysterectomies irrespective of their reproductive age.

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Hysterectomy is one of the most common surgical interventions for women in Western countries, and about 90% of hysterectomies are performed for treating uterine leiomyomas, dysfunctional bleeding, pelvic organ prolapse, and other non-malignant diseases of the uterus.[1][2] None the less, for many of these conditions, this intervention is very controversial, and professional uncertainty is reflected in the considerable small area variations in hysterectomy rates.[3] National level rates also vary greatly, ranging from 10 per 10 000 women in Norway and Sweden[4] to about 60 per 10 000 women in North America, with the rates for Britain and other European countries falling within this range.[4] The extent to which these variations are attributable to psychosocial and cultural factors is so great that understanding the differences in rates entails examining societies more than histological specimens.[6]

In recent times, hysterectomy rates have been decreasing in the USA[7] because of the availability of less invasive techniques for removing leiomyomas or modifying bleeding, including endoscopy,[8] embolisation,[9] hormonal therapy,[10] and percutaneous laser thermoablation.[11] Although it has been reported that hysterectomy may increase cardiovascular risk factors such as hypertension and body mass index[12] and it may predispose to ovarian failure and, indirectly, to loss of libido,[6] these issues are still controversial.[13] Prevention of uterine and cervical cancer,[1] undiagnosed pelvic pain,[1] and sterilisation[14] were at one time common reasons for the procedure, yet with the availability of ultrasonography, even large leiomyomas are no longer an unequivocal indication for hysterectomy in the absence of bleeding or pain.[15] Furthermore, the great quantity of internet sites created by lay women associations and discussion groups on alternatives to hysterectomy indicates that the pattern of demand is also changing.

Socioeconomic factors are also related to variations in hysterectomy rates. Specifically, in the United Kingdom,[16][17] Denmark,[18][19] the United States,[20–22] and Australia,[23][24] this intervention has been observed to be more common among women of lower educational and income level. In the United States, the rate of hysterectomy was reported to be higher for black than for white women.[5] By contrast, hysterectomy has been shown to be positively associated with income in studies performed in Los Angeles (USA)[25] and Finland.[26][27]

The aim of this study was to evaluate whether socioeconomic level is related to hysterectomy undertaken for different medical reasons and in different age groups.

METHODS

The study population consisted of 3498 women, aged 35 years or more and residing in Rome, who in 1997 underwent a hysterectomy, excluding pelvic evisceration (ICD-9-CM 68.3–68.7, 68.9). The data analysed were those reported on hospital discharge records, retrieved through the hospital information system run by the health authority of the Lazio Region. This system collects and manages data from all discharges from both public and private hospitals in the region as well as discharges of Lazio residents hospitalised elsewhere in Italy. In 1997 the region had 223 acute hospitals (186 public or contracted hospitals and 37 private hospitals), and all but five (all private) provided data to the system (the five hospitals not providing data had a total of 298 beds and represented 13.5% of the private hospitals and 2.2% of total hospitals). Completeness and accuracy of data collected through the regional information system were sufficiently good in 1997, as shown by quality of coding indicators (average number of procedures by discharge abstract = 1.7; percentage of missing or wrong principal diagnosis = 2%).

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Abbreviations: SES, socioeconomic status; CBR, census block of residence

Table 1 Crude hospitalisation rates (CHR women aged 35 or more × 10000) for hysterectomy by cause and age group. Rome, 1997

| Causes of hysterectomy | Age group | | | | | | | | | | | |
| | 35–49 years | | | | 50+ years | | | | Overall | | | |
	Number	%	CHR	95% CI	Number	%	CHR	95% CI	Number	%	CHR	95% CI
Malignant causes												
cancer of uterus	98	6.6	3.3	2.7 to 4.0	295	17.9	5.3	4.7 to 5.9	393	12.5	4.6	4.2 to 5.1
other malignancies	40	2.6	1.3	1.0 to 1.8	129	7.8	2.3	1.9 to 2.7	169	5.4	2.0	1.7 to 2.3
total	138	9.2	4.7	3.9 to 5.5	424	25.7	7.6	6.9 to 8.4	562	17.9	6.6	6.1 to 7.1
Non-malignant causes												
leiomyomas	848	56.8	28.6	26.8 to 30.6	429	26.0	7.7	7.0 to 8.5	1277	40.6	15.0	14.2 to 15.8
other benign neoplasm of uterus	94	6.3	3.2	2.6 to 3.9	58	3.5	1.0	0.8 to 1.3	152	4.8	1.8	1.5 to 2.1
other disorders of uterus	245	16.4	8.3	7.3 to 9.4	131	8.0	2.3	2.0 to 2.8	376	12.0	4.4	4.0 to 4.9
genital prolapse	50	3.3	1.7	1.3 to 2.2	464	28.2	8.3	7.6 to 9.1	514	16.4	6.0	5.5 to 6.6
benign neoplasm and disorders of ovary	22	1.5	0.7	0.5 to 1.1	68	4.1	1.2	1.0 to 1.5	90	2.9	1.1	0.9 to 1.3
disorders of menstruation	30	2.0	1.0	0.7 to 1.4	26	1.6	0.5	0.3 to 0.7	56	1.8	0.7	0.5 to 0.9
other non malignancies	67	4.5	2.3	1.8 to 2.9	47	2.9	0.8	0.6 to 1.1	114	3.6	1.3	1.1 to 1.6
total	1356	90.8	45.8	43.4 to 48.3	1223	74.3	21.9	20.7 to 23.2	2579	82.1	30.2	29.1 to 31.4
All causes	1494	100	50.4	47.9 to 53.1	1647	100	29.5	28.1 to 31.0	3141	100	36.7	35.5 to 38.1

We applied an area based index of socioeconomic status (SES), developed using 1991 census data on the following characteristics of the census block of residence (CBR, average inhabitants equal to 480): percentage of people by educational level, percentage of people employed by occupational category, percentage of unemployed men of working age, percentage of one person families, percentage of families with five or more persons, crowding index (persons/room), and percentage of dwelling rented or owned. The index is described in detail elsewhere.[28] The index showed a 0.63 linear correlation with the mean CBR per capita income among residents in Rome. Four levels of SES were defined on the basis of the 20th, 50th, and 80th centiles of the SES distribution (SES level I included women with the highest SES; level IV included those with the lowest SES). The SES was determined for 3141 (89.7%) of the 3498 women who underwent a hysterectomy in 1997; for the remaining 360 women, information on residence was not complete.

Episodes of hysterectomy were then subdivided according to the primary cause of hospitalisation (both malignant and not-malignant diseases), using ICD-9 codes of principal diagnosis (except for cancer, which was selected even if reported as a secondary diagnosis). Specifically, we considered the following mutually exclusive groups: uterine cancer (ICD9: 179, 180, 182, 233.1, 233.2, 236.0), other malignancies (ICD9: 140–208, 230–239, excluding uterine cancer), leiomyoma (ICD9: 218), other benign neoplasms of the uterus (ICD9: 219), disorders of the uterus not classified elsewhere (ICD9: 621), genital prolapse (ICD9: 618), benign neoplasm and disorders of ovary (ICD: 220, 620), disorders of menstruation (ICD9: 626), and the remaining non-malignant causes.

Direct age standardised hospitalisation rates and their 95% confidence intervals (CI) were calculated for each of the four SES levels, with the 1996 Rome population as reference population.

The ratios of standardised rates and their 95% CI were calculated to measure the excess risk of lower SES levels (levels II, III, and IV) compared with the highest level (level I). A weighted linear regression was performed on the logarithm of the rates to test for the existence of a trend across the SES levels.

RESULTS

The hysterectomy rate was 36.7 per 10 000 women aged 35 years or more (corresponding to 22.7 per 10 000 women of all ages). Eighteen per cent of the hysterectomies were performed for malignant causes, whereas the majority of hysterectomies (82%) were performed for non-malignant diseases of the uterus or annexes (table 1); almost half were performed for leiomyomas and other benign neoplasms of the uterus and 16.4% for genital prolapse. While cancer and prolapse were more frequent after 50 years of age, leiomyoma is responsible of 57% of hysterectomies in women aged 35–49 years and of 26% in those aged 50 years or more, resulting in hysterectomy rates for leiomyoma of 28.6 and of 7.7 per 10 000 in the two age groups, respectively (table 1).

The age standardised hospitalisation rates of hysterectomy for all causes showed a significant relation with SES (table 2). The risk of hysterectomy was 34% higher for the least affluent group (level IV) compared with the most affluent group (level I), and the linear regression showed a significant increase in rates with decreasing SES (p=0.013).

Table 2 Age standardised hospitalisation rates (SHR × 10000 women aged 35 or more) and ratio of standardised rates (RSR) for hysterectomy attributable to any cause by socioeconomic status. Rome, 1997

Socioeconomic level	Number	SHR	95% CI	RSR	95% CI
I	515	31.1	28.5 to 33.9	1.00	
II	979	34.4	32.4 to 33.7	1.11	0.99 to 1.23
III	996	39.4	37.1 to 42.0	1.26	1.14 to 1.41
IV	651	41.8	38.7 to 45.1	1.34	1.19 to 1.51
Total	3141				
Linear test for trend		0.013			

Table 3 Age standardised hospitalisation rates (SHR × 10000 women aged 35 or more) and ratio of standardised rates (RSR) for hysterectomy attributable to malignancies by socioeconomic status and age group. Rome, 1997

Socioeconomic level	Number	SHR	95% CI	RSR	95% CI
Overall					
I	92	5.3	4.3 to 6.5	1.00	
II	187	6.5	5.6 to 7.5	1.22	0.95 to 1.57
III	174	7.1	6.1 to 8.3	1.34	1.04 to 1.72
IV	109	7.2	5.9 to 8.6	1.34	1.01 to 1.77
Total	562				
Linear test for trend		0.113			
35–49 years					
I	20	3.7	2.4 to 5.8	1.00	
II	33	3.4	2.4 to 4.8	0.91	0.52 to 1.59
III	46	5.1	3.8 to 6.8	1.35	0.80 to 2.28
IV	39	7.0	5.1 to 9.6	1.88	1.09 to 3.22
Total	138				
Linear test for trend		0.079			
50+ years					
I	72	6.2	4.9 to 7.8	1.00	
II	154	8.2	7.0 to 9.6	1.32	1.00 to 1.75
III	128	8.2	6.9 to 9.8	1.33	0.99 to 1.78
IV	70	7.2	5.7 to 9.1	1.17	0.84 to 1.63
Total	424				
Linear test for trend		0.623			

Table 4 Age standardised hospitalisation rates (SHR × 10000 women aged 35 or more) and ratio of standardised rates (RSR) for hysterectomy attributable to non malignant causes by socioeconomic status and age group. Rome, 1997

Socioeconomic level	Number	SHR	95% CI	RSR	95% CI
Overall					
I	423	25.8	23.4 to 28.4	1.00	
II	792	28.0	26.1 to 30.0	1.08	0.98 to 1.20
III	822	32.3	30.2 to 34.6	1.25	1.13 to 1.38
IV	542	34.7	31.9 to 37.8	1.34	1.20 to 1.50
Total	2579				
Linear test for trend		0.012			
35–49 years					
I	187	34.8	30.2 to 40.2	1.00	
II	410	42.3	38.4 to 46.6	1.22	1.02 to 1.45
III	453	50.2	45.8 to 55.0	1.44	1.22 to 1.71
IV	306	55.6	49.7 to 62.2	1.60	1.33 to 1.92
Total	1356				
Linear test for trend		0.011			
50+ years					
I	236	21.0	18.5 to 23.9	1.00	
II	382	20.4	18.4 to 22.5	0.97	0.82 to 1.14
III	369	22.8	20.6 to 25.3	1.09	0.92 to 1.27
IV	236	23.6	20.8 to 26.8	1.12	0.94 to 1.34
Total	1223				
Linear test for trend		0.151			

For malignancies, although the hysterectomy rate was significantly higher for SES levels III and IV compared with level I among women aged 35 years or more, the linear trend was not significant at 0.05 level (table 3). The risk of hysterectomy was particularly high among the most disadvantaged women in age group 35–49 (88% higher risk compared with level I).

As regards non-malignant conditions (table 4), we observed a significant inverse association between SES and hysterectomy in women aged 35–49 years (p=0.009) but not in those aged 50 or more. Among the women of the youngest age group, the risks of hysterectomy in lower SES levels were all significantly higher compared with level I (22%, 44% and 60% increase for level II to IV respectively).

Table 5 Age standardised hospitalisation rates (SHR × 10000 women aged 35 or more) and ratio of standardised rates (RSR) for hysterectomy attributable to leiomyoma and genital prolapse by socioeconomic status. Rome, 1997

Socioeconomic level	Leiomyoma				
	Number	SHR	95% CI	RSR	95% CI
I	196	12.4	10.8 to 14.3	1.00	
II	401	14.3	12.9 to 15.7	1.15	0.97 to 1.36
III	413	16.0	14.5 to 17.6	1.29	1.09 to 1.53
IV	267	17.0	15.0 to 19.1	1.37	1.14 to 1.65
Total	1277				
Linear test for trend		0.019			

Socioeconomic level	Genital prolapse				
	Number	SHR	95% CI	RSR	95% CI
I	86	4.7	3.8 to 5.8	1.00	
II	158	5.5	4.7 to 6.4	1.16	0.89 to 1.51
III	162	6.6	5.7 to 7.8	1.41	1.08 to 1.83
IV	108	7.1	5.9 to 8.5	1.49	1.12 to 1.99
Total	514				
Linear test for trend		0.022			

Key points

- Leiomyomas are the most frequent cause of hysterectomy in Rome especially among women aged less than 50 years.
- The risk of hysterectomy is higher among women of lowest socioeconomic position compared with well off women. This inverse association is largely dependent on benign diseases of uterus, particularly leiomyoma.
- More affluent women probably have a greater uptake of modern, less invasive techniques for removing leyomioma.
- There is a need of educational interventions for both women and health professionals regarding alternatives to hysterectomy to reduce unequal provision of inappropriate surgery.

Table 5 reports the results for the two most frequent non-malignant causes of hysterectomy. A significant inverse association was found for both leiomyoma (p=0.019) and genital prolapse (p=0.022). In the case of leiomyoma, the trend was significant for both women aged 35–49 (p=0.039) and those aged 50 years or more (p=0.009).

DISCUSSION

Our results show that hysterectomy rate in Rome is similar to that observed in England, much lower compared with the United States and Finland, and almost double those in Scandinavian countries.[4 26] Hysterectomy rate was much higher among women 35–49 years compared with women aged 50 years or more, and the difference is largely depending on interventions for leiomyoma. A similar pattern of hysterectomy rates by age and by cause has been reported from the United States by Wilkox et al.[5]

The higher risk of hysterectomy among women with a low SES, compared with more affluent and educated women, can for the most part be attributed to a higher frequency of surgery performed to treat benign disorders, particularly leiomyomas and genital prolapse. However, we were not able to establish whether this higher frequency reflects actual variations in disease prevalence or a different pattern of primary or secondary care, as no data on morbidity for benign uterine disorders by social class are available. Nevertheless, risk factors for leiomyoma, such as low parity[17] and hormonal treatment with oestrogen for menopause symptoms,[29] have been reported to be more frequent among affluent socioeconomic groups.[26 30] It is thus unlikely that leiomyoma is more prevalent among less affluent women, and alternative explanations must therefore be found. It has been argued that women of low SES are less likely to undergo regular gynaecological examinations than women of high SES and they may present to consultation when leiomyoma and genital prolapse are too advanced to be treated with less radical means.[21] Moreover, women with a low educational level have been reported to be less knowledgeable about treatment and thus less capable of expressing preferences, resulting in their being more likely to comply with the offer of hysterectomy.[31] Another possible explanation for the inverse relation between hysterectomy for benign disorders and socioeconomic position can be found in the Tudor Hart's inverse care law.[32] According to the law, the most affluent groups would have a more prompt uptake of innovative, less invasive techniques for removing uterine leiomyoma, with less affluent women being more vulnerable to inappropriate hysterectomy.

Although the significant association between hysterectomy and socioeconomic position observed only in age group 35–49 seems to be dependent on the higher frequency of leiomyoma before menopause, there is no effect modification of age on this relation, as a significant inverse association between hysterectomy rate and SES was found among women of both younger and older age groups. From a public health perspective however, it is worrying that reproductive age may not be a deterrent against potentially inappropriate interventions.

Although the results of our study confirm those of most other studies on socioeconomic patterns of hysterectomy,[16–24] they are not concordant with reports from Finland, which have found a positive association between disposable family income and surgical rates for hysterectomy, as well as rates for cataract removal, suggesting that there exist socioeconomic disparities in access to health care services.[26 27] In Rome, lower socioeconomic groups have equal access to facilities for low discretionary, effective treatment, such as surgery for hip fracture or cataract removal.[33] At the same time, they are more frequently hospitalised than higher socioeconomic groups for interventions considered to be specifically or generically inappropriate, such as appendicectomy or minor skin diseases[33] despite the fact that low socioeconomic position is not considered a risk factor for these conditions.

There is evidence that providing better information to the patient on the potential advantages and risks of treatment can reduce hospital use.[34] In Switzerland, the prevalence of hysterectomy was found to be significantly higher among privately insured patients, compared with those who were generally insured, and among the general population, compared with female doctors and lawyers' wives.[35] None the less, hysterectomy rates sharply fell after a mass media public education

campaign,[36] emphasising the importance of information in modifying both the demand for hospital services and the offer of these services. Improving patient-doctor communication may reduce unnecessary surgery when effective, less radical treatment becomes available.

Our study shows that women of lower socioeconomic position aged 35–49 years have higher rates of hysterectomy because of malignancies, compared with more affluent women, albeit the linear trend was not statistically significant. This result is consistent with 1990–95 mortality data for uterine cancer in Rome, which show a significant inverse relation with socioeconomic position.[28]

In interpreting our results, several potential biases must be taken into consideration. Specifically, we assigned socioeconomic status using a small area index, previously used in studies on differentials in mortality in Rome.[28] Thus misclassification may have occurred, though geographical indices are considered to be a sufficiently robust and valid option when individual information is lacking.[37–39] None the less, it is more likely that the effects of individual characteristics were underestimated, as compared with being overestimated.[40 41]

As mentioned, five hospitals did not provide data in 1997; as they are all private hospitals, most patients probably have a fairly high socioeconomic status. However, these hospitals only represented a small percentage of the private hospitals and a negligible percentage of total hospitals.

Differences in access to treatment do not necessarily signify inequality, unless they are adjusted for need[42]; thus, as morbidity data by socioeconomic position were not available for benign conditions, we discussed the prevalence of risk factors among socioeconomic groups. Finally, discharge abstracts provide no indications of the clinical appropriateness of interventions.

In conclusion, this study provides data on hysterectomy rates by age groups in Rome, which can also be used for comparisons with other countries. We show that hysterectomy for leiomyoma is widely practised in Rome regardless of age despite the availability of less radical interventions. Furthermore, this study shows that women of low SES undergo hysterectomy, especially for leiomyoma, more frequently than those with a high SES. The results of this study show the need to implement educational interventions for both women and health professionals regarding alternatives to hysterectomy for uterine disorders.

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