

TABLE 1. Yearly Distribution of Patients With Pubic Lice

Year	Total No. of Patients (n = 9093)	No. of Cases of Pubic Lice (%) (n = 197)
1988	265	4 (1.5)
1989	344	11 (3.2)
1990	418	14 (3.3)
1991	623	29 (4.7)
1992	813	11 (1.4)
1993	783	11 (1.4)
1994	829	20 (2.4)
1995	763	15 (2.0)
1996	737	11 (1.5)
1997	671	12 (1.8)
1998	674	18 (2.7)
1999	709	14 (2.0)
2000	714	13 (1.8)
2001	750	14 (1.9)

antigen by means of an enzyme immunoassay (EIA) Chlamydiazyme; Abbott Laboratories, Abbott Park, IL) and, after 1997, with polymerase chain reaction (Amplicor; PCR Diagnostic, Roche Diagnostic Systems, NJ) and ligase amplification reaction (LCx Chlamydia; Abbott Laboratories). We included testing for detection of syphilis (RPR, TPHA, and FTA), HIV (EIA and Western blotting), and genital herpes (direct IF; Syva Microtrack, Behring Diagnostics, Cupertino, CA) with a viral pack (Biomedics, Barcelona, Spain) and shell vial with immunofluorescence and conventional culture.

Tobacco use was defined as moderate at less than 20 cigarettes per day and high at more than 20 per day.^{7,8} Alcohol intake was defined as at least 80 g per day for men and 20 g per day for women.⁹

Statistical analysis was performed by means of chi-square tests, with Yates correction where appropriate. Values of $P < 0.05$ were considered to denote statistical significance.

Results

In the period of study, a diagnosis of pubic lice was made in 197 cases (2.2%). There were 127 infested males (3.7%) and 70 infested females (1.2%); the male-to-female ratio was 1.8:1. Among men, more cases involved MSM (29 of 152 cases) than heterosexual men (98 of 3248 cases) ($P < 0.001$). The distribution by years, with a range of 1.3% to 4.6% per year, is shown in Table 1. The social and demographic factors of the cases and the control group are shown in Table 2. The age range in the index group was 15 to 69 years (mean, 30.3); there were 12 females (17.1%) and 25 males (19.7%) older than age 35 years. In 67.5% of the cases the patients were single. The type of sexual relationship was mainly sporadic in 40.1% and with a partner in 27.9%. Condoms were used by 34 patients (17.2%). There was a statistical difference between the index and control groups with regard to single status ($P < 0.001$) and more use of condoms ($P < 0.01$) among men with pubic lice. The seasonal distribution of cases was as follows: 45 in winter, 51 in spring, 45 in summer, and 56 in autumn.

Table 3 shows the association of other STDs and genital microorganisms with pubic lice and in the control group. In males, the most frequent disease (31.4%) was urethritis (including ureaplasma, chlamydial, trichomonal, and gonococcal urethritis), followed by candidal balanitis (7.1%); in females, the most frequent were vulvovaginitis (including candidiasis and trichomoniasis) and bac-

terial vaginosis (40%) and cervicitis (17.2). Pubic lice were associated with HIV antibodies in 9 patients (4.6%): 3 female intravenous drug users (IDUs, 2 of whom were female prostitutes), 2 MSM, and 4 IDU heterosexual men. There was a statistical difference between the index and control groups with regard to more VIH infections ($P < 0.01$) in women with pubic lice and more cases of genital candidiasis ($P < 0.001$), VIH infection ($P < 0.01$), genital warts ($P < 0.001$), and hepatitis C infection ($P < 0.05$) among men in the control group.

The most frequent clinical symptoms were itching in 151 patients (76.6%) and erythema in 84 patients (42.6%), and 34% of the known partners complained of clinical symptoms (Table 4). During the period of study, reinfestations occurred in 15 patients (7.6%; 14 males and 1 female): 13 patients twice, 1 patient three times, and 1 four times. Among men, there were more reinfestations in MSM (8 of 21 cases) than in heterosexuals (6 of 92 cases; $P < 0.01$). The reinfestations occurred in all patients more than 1 year after the previous episode.

The pediculicide treatment was with lindane for 193 patients (98%) and with permethrin for 4 (2%). Treatment was successful for 196 of 197 patients (99.5%). One patient had pubic lice after the treatment with lindane.

Discussion

Phthirus pubis is a specific parasite of humans, and although its transfer to a dog has been recorded,¹⁰ it cannot survive off the host for more than 24 hours.¹ The pubic louse is spread primarily through close physical or sexual contact, with about 95% of sexual contacts becoming infested.¹¹ During the 1970s, there was an increase in Edinburgh (Scotland), with one case for each 9 of gonococcal disease in males and for each 18 in women.¹² Records of new cases seen at genitourinary medicine clinics in the UK showed an increase from 6168 cases in 1976 to 10,522 in 1986.¹³ In Israel, pubic lice infestation increased from 7 per 1000 in 1977 to 14.9 per 1000 in 1983 and then declined to 4.6 per 1000 in 1987.¹⁴ In the same country, Israeli soldiers showed a sharp decline, 13.6-fold, from the 1970s to the present day.¹⁵ In a study of rape victims, Estrich et al.¹⁶ found one case of pediculosis pubis among 124 women (0.8%).

These figures indicate the trend in infestation rates, but the actual number of infections could be much higher, as many are dealt with by family physicians or by self-medication.¹ In our country, the yearly distribution shows a stable number of patients, ranging between 1.3% and 4.7%, with a peak in the number of cases in 1991. In Britain, in the period of 1975 to 1986, the range was 1.4% to 1.9%.¹³

Like other STDs, pubic lice can serve as a warning of the possible presence of other such diseases: 31.4% of the patients infested had other STDs.¹⁷ In our study, 75.6% of patients either were infected with another genital microorganism or had another STD or both (46.7% had only another STD), and 4.6% had HIV antibodies. Reports on STDs in patients with pubic lice differ. Earlier studies documented a high prevalence among adults with pubic lice, although without statistical significance; Opayene et al.¹⁸ found a higher prevalence in the control group and, in a recent study of adolescents,¹⁹ a higher chlamydial infection in the index group than in the control group, although this study did not include a complete STD evaluation.

In our population, we found STDs more frequently in the index group but found STDs such as genital candidiasis and genital warts more frequently in the control group; the reasons for these findings are unclear. Very little has been written about the effect that HIV infection has on infestation with pubic lice, and it appears that the

TABLE 2. Social and Demographic Factors in Pubic Lice Cases and the Control Group

Factor	No. (%) of Cases			No. (%) of Controls		
	Females (n = 70)	Males (n = 127)	Total (n = 197)	Females (n = 5623)	Males (n = 3273)	Total (n = 8896)
Age (y): range (mean)	17–61 (30.0)	15–69 (30.3)	15–69 (30.2)	14–74 (28.9)	15–79 (33.7)	14–79 (30.3)
Patients older than 35 years	12 (17.1)	25 (19.7)	37 (18.8)	1142 (20.3)	1205 (36.8)	2347 (26.4)
Marital status*						
Married	16 (22.9)	23 (18.1)	39 (19.8)	1156 (20.6)	1072 (32.8)	2228 (25)
Divorced	17 (24.3)	4 (3.1)	21 (10.7)	1007 (17.9)	299 (9.1)	1306 (14.7)
Single	34 (48.6)	99 (78.0)	133 (67.5)	3312 (58.9)	1837 (56.1)	5149 (57.9)
Widow	3 (4.3)	1 (0.8)	4 (2.0)	148 (2.6)	65 (2)	213 (2.4)
Country/Region						
Western Europe						
Spain	64 (91.4)	126 (99.2)	190 (96.4)	3210 (57.1)	3220 (98.4)	6430 (72.3)
Other country	2 (2.8)	—	2 (1)	268 (4.8)	15 (0.4)	283 (3.2)
Eastern Europe	—	—	—	306 (5.4)	4 (0.1)	310 (3.5)
Latin America & Caribbean	4 (5.7)	1 (0.8)	5 (2.5)	1724 (30.6)	26 (0.8)	1750 (19.7)
Africa	—	—	—	100 (1.8)	8 (0.2)	108 (1.2)
Asia	—	—	—	15 (0.3)	—	15 (0.2)
Type of sexual relationship						
With partner	31 (44.3)	24 (18.9)	55 (27.9)	1577 (28)	1290 (39.4)	2867 (32.2)
Sporadic*	14 (20)	65 (51.2)	79 (40.1)	612 (10.9)	1321 (40.4)	1933 (21.7)
With female prostitute	NA	38 (29.9)	38	NA	662 (20.2)	662
Female prostitute with professional contact	25 (35.7)	NA	25	3434 (61.1)	NA	3434
Alcohol use						
High	4 (5.7)	14 (11)	18 (9.1)	360 (6.4)	270 (8.2)	630 (7.1)
Moderate	32 (45.7)	86 (67.7)	118 (59.9)	2928 (52.1)	2179 (66.6)	5107 (57.4)
None	33 (47.1)	28 (22)	61 (31)	2335 (41.5)	824 (25.2)	3159 (35.5)
Tobacco use						
High	24 (34.3)	60 (47.2)	84 (42.6)	2555 (45.4)	1388 (42.4)	3943 (44.3)
Moderate	26 (37.1)	28 (22)	54 (27.4)	1282 (22.8)	767 (23.4)	2049 (23)
None	20 (28.6)	39 (30.7)	59 (29.9)	1786 (31.8)	1118 (34.2)	2904 (32.6)
Parenteral drug abuse						
Yes	6 (8.6)	17 (13.4)	23 (11.7)	536 (9.6)	394 (12)	930 (10.4)
No	64 (91.4)	110 (86.6)	174 (88.3)	5087 (90.5)	2879 (88)	7966 (89.5)
Oral contraceptive use						
Yes	31 (42.3)	NA	31	3049 (54.2)	NA	3049
No	39 (55.7)	NA	39	2574 (45.8)	NA	2574
Condom use†						
Yes	15 (21.4)	19 (15)	34 (17.3)	2107 (37.5)	235 (7.2)	2342 (26.3)
No	55 (78.6)	108 (85)	163 (82.7)	3516 (62.5)	3038 (92.8)	6554 (73.7)

NA = not applicable.

* $P < 0.001$.† $P < 0.01$.

ectoparasites show the same clinical characteristics, regardless of HIV serostatus; the Center for Disease Control and Prevention recommends the same treatment regardless of HIV serostatus.²⁰ Our few patients infected with HIV exhibited the same clinical characteristics as non-HIV-infected patients, and one explanation is that pediculicide treatment efficacy is independent of the immunologic status of the patient.

Classic infection is confined to those of a low socioeconomic status³ and frequently is associated with the presence of other sexually transmitted infections, as mentioned above; thus, these patients should be examined for such infections.⁴ Risk factors for pediculosis pubis in women are pregnancy and age less than 25 years, and in men, lack of a steady partner, multiple partners, unmarried status, and homosexual behavior,²¹ all of which can be considered sexual activity factors. In our series, the prototype patient was a single person who had sporadic sexual intercourse and did not use condoms. Of the males, 51.2% had a relationship with a female prostitute. There was no seasonal pattern in our cases, which contrasts with the results of other investigators,¹⁴ who

reported that this disease is more frequent in the cooler months of the year.

It has been stated that the population with the highest incidence of pubic lice is similar to that with the highest incidence of gonorrhea and syphilis—that is to say, persons aged 15 to 25 years—and that the prevalence declines gradually to age 35 years, after which infestation becomes rare.⁵ Fisher and Morton¹² found infestation most commonly in women aged between 15 and 19 years and men more than 20 years old. Similarly, another study²² demonstrated a higher prevalence (0.3%) in girls between 13 and 15 years old than in boys of the same age range (0.1%). However, the age distribution in our study was clearly different, since nearly 19% of the infested patients were older than age 35 years. This could be due to the influence of the Spanish population pyramid, with an aging population, as seen in few other parts of Europe.

These lice colonize the genital and inguinal regions but occasionally may colonize eyebrows, eyelashes, beard, axillae, areolar hair, and occasionally scalp hair, particularly the scalp margins.^{23–36} A case of an associated inflammatory tubo-ovarian tu-

TABLE 3. Other Sexually Transmitted Diseases and Genital Microorganisms Associated With Pubic Lice Cases and the Control Group

STD or Genital Infection (n = 131)	No. (%) of Patients			No. (%) of Controls		
	Female (n = 70)	Male (n = 127)	Total (n = 197)	Females (n = 5623)	Males (n = 3273)	Total (n = 8896)
Ureaplasma urethritis	NA	28 (22)	28	NA	513 (15.7)	513
Genital candidiasis	16 (22.9)	9 (7.1)	25 (12.7)	1710 (30.4)	821 (25.1)	2531 (28.5)
Genital warts*	2 (2.9)	4 (3.1)	6 (3)	394 (7)	614 (18.8)	1008 (11.3)
HIV infection	6 (8.6)	3 (2.4)	9 (4.6)	121 (2.1)	343 (10.5)	464 (5.2)
Chlamydial cervicitis/urethritis	4 (5.7)	5 (3.9)	9 (4.6)	230 (4.1)	96 (2.9)	326 (3.7)
Bacterial vaginosis	8 (11.4)	NA	8	611 (10.9)	NA	611
Trichomoniasis	6 (8.6)	2 (1.6)	7 (3.5)	519 (9.2)	20 (0.6)	539 (6)
Gonococcal cervicitis/urethritis	—	5 (3.9)	5 (2.5)	31 (0.5)	74 (2.3)	105 (1.2)
Hepatitis C	3 (4.3)	2 (1.6)	5 (2.5)	74 (1.3)	221 (6.7)	295 (3.3)
Genital herpes	2 (2.9)	2 (1.6)	4 (2)	181 (3.2)	422 (7.4)	422 (4.7)
Syphilis	2 (2.9)	1 (0.8)	3 (1.5)	146 (2.6)	153 (4.7)	299 (3.4)
<i>Molluscum contagiosum</i>	1 (1.4)	1 (0.8)	2 (1.0)	49 (0.9)	36 (1.1)	85 (0.9)
Hepatitis B	—	—	—	35 (0.6)	109 (3.3)	144 (1.6)
Scabies	—	—	—	43 (0.8)	62 (1.9)	105 (1.2)

NA = not applicable.

*First diagnosis (in addition, recidivation occurred in 1 female and 4 males).

mor has been described.³⁷ In heavy infections in men, the hair on the trunk and limbs may be extensively colonized,³⁸ and a case has been reported in which the presence of an enormous population of lice was attributed to inappropriate use of topical steroids.³⁹ Furthermore, pubic lice infestation could be a marker of sexual abuse.^{40,41}

In a study of 121 patients with pediculosis pubis, Chapel et al¹⁷ noted the presence of the parasite in pubic hair in 118 patients. In 38 men (37.3%) and 18 women (94.7%), the pubic region was the sole area of involvement. Pruritus was reported by 104 patients (85.9%), while excoriations were observed in 30 (24.8%) and maculae cerulea in 1. In our patients the infestation was confined to the genital region, and the predominant symptoms were itching (76.6%) and erythema (42.6%). Because of the unspecific symptoms of this disease, we look for it actively in all patients attending the STD clinic. Superinfection was present in one patient (0.5%). During the period of study, 11% of the male patients (mainly MSM) had a reinfestation ($P < 0.01$), and reinfestation was more frequent than in females ($P < 0.05$).

TABLE 4. Clinical Signs and Symptoms in the Patients With Pubic Lice

Clinical Sign or Symptom	No. (%) of Cases		
	Female (n = 70)	Male (n = 127)	Total (n = 197)
Itching	51 (72.9)	100 (78.7)	151 (76.6)
Erythema	24 (34.3)	60 (47.2)	84 (42.6)
Superinfection	—	1 (0.8)	1 (0.5)
Clinical symptoms in partners			
Yes	29 (41.4)	38 (29.9)	67 (34)
No	27 (38.6)	30 (23.6)	57 (28.9)
Unknown	9 (12.9)	50 (39.4)	59 (29.9)
Reinfestation(s)	1 (1.4)	14 (11)	15 (7.6)
Females	1	NA	
Heterosexual men	NA	6	
MSM	NA	8	

MSM = men who have sex with men; NA = not applicable.

Pediculosis pubis was associated in a previous study²¹ with sexual activity factors, but the reason for the higher frequency in MSM than in the women prostitutes with multiple sexual contacts is not clear. The explanation may be socioeconomic, pharmacological, or environmental, or the higher frequency may be due to prevention policy modifications—the same factors that have been suggested by other authors as possible causes of the reduction in the prevalence of this disease.¹⁵ One other possible explanation is that the female patients depilate more frequently than the men (65% versus 0%; data not shown), and the hairs are necessary to the lice.

One heterosexual male patient, who was negative for HIV antibodies, became reinfested immediately after the treatment with lindane. Resistance of head lice to lindane was reported in the United Kingdom in 1971 and in the Netherlands in 1978. Resistance develops easily when nymphs rather than adults are exposed, and it also occurs because of the use of inadequate quantities of the pediculicide, such as shampoo.⁴² It seems probable that our patient's reinfestation was due not to failure of the pediculicide itself (treatment was successful for 99.5%) but to its incorrect application.

In conclusion, the data of recent years show that among our patients the incidence of infestation was stable during the period of study, with an older age range than reported previously, a high frequency of other associated STDs, and a statistically higher number of reinfestations in males than in females. The MSM were more frequently infested and reinfested than heterosexual men.

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