Management and cost of genital warts in Italy

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BACKGROUND

- Genital warts (GW) are common and increasing in sexually active people. Ninety percent of GW in Europe are due to Human papillomavirus (HPV) types 6 and 11[1].
- Current GW treatments are often long, painful and unsatisfactory because of the relatively high number of recurrent and resistant cases that require repeated visits and result in a noteworthy economic impact[2-5].
- Randomized controlled trials show that a quadrivalent HPV vaccine is effective in preventing up to 100% of HPV 6, 11, 16 and 18 related diseases[6].
- In order to assess the expected benefits of a hypothetical HPV vaccination programme, national public health authorities need to know the cost burden associated with HPV-related diseases.

OBJECTIVES

The objective of this study was to assess treatment patterns and costs associated with the treatment of GW in Italy from the societal perspective.

METHODS

Study design

- A multi-centre, retrospective, observational study was designed to involve 40 investigators in public gynaecological, dermatological, and sexually transmitted disease (STD) centres, enrolling 360 patients with external and/or internal GW aged 14-64 years.
- GW case definition included:
  - newly diagnosed GW

  - recurrent GW

  - resistant GW

- Investigators documented medical resource utilisation and absence from work for the treatment of GW and related complications in 2005.
- Mean costs per patient were estimated from the third party payer as well as a societal perspective.

Unit costs

- Ambulatory unit costs were derived by applying the appropriate official regional fees[7] to the local codification of medical procedures.

Table 1. *Ambulatory unit costs*

Category	Item	Cost range (€)
Physician visits	Gynaecological	13.6 – 23.0
	Other	11.7 – 23.0
Office-based procedures	Application of Podophyllin resin	3.6 – 4.3
	Application of Trichloroacetic acid	3.9 – 12.8
	Cryotherapy	8.4 – 18.4
	Electrotherapy	12.8 – 36.2
	Laser therapy	7.9 – 29.8
	Curettage	8.4 – 29.8
Examinations	Application of Acetic acid	3.9 – 6.2
	Pap smear	2.6 – 13.7
	Colposcopy	10.3 – 15.4
	Biopsy	13.9 – 35.0
	HPV DNA detection	14.1 – 114.1
	Urethroscopy/Meatoscopy	27.3 – 35.8
	Anoscopy/Proctoscopy	22.7 – 32.5

- Prices of medications paid for by the public health service or by the patients came from the national pharmaceutical formulary[8].
- Day-hospital (DH) and inpatient admission fees were taken from the national tariffs of interregional mobility across public hospitals[9].

Table 2. *Hospitalisation unit costs*

Category	Item	Cost range (€)
Hospitalisations (DH/Inpatient)	Operation on anus and stoma without	1416 / 1327
	Perianal and pilonidal operations	1600 / 1500
	Other operations on skin, subcutaneous tissue and breast without complications	1403 / 1315
	Operation on vagina, cervix and vulva	1554 / 1943

- All medical resource fees and prices refer to 2005
- Days off work were valued according to the average daily earnings stratified by gender and age class from national labour statistics[10].

RESULTS

Patient sample

- A total of 28 investigators (15 dermatologists, 7 gynaecologists and 6 specialists of STD clinics) enrolled **341 patients** (189 men and 152 women).
- Newly diagnosed, recurrent and resistant episodes were respectively 194 (56.9%), 81 (23.7%) and 66 (19.4%).
- Mean age was 33.1 years (±10.4 sd), 49 (14.4%) patients reported previous sexually transmitted infections, and 22 (6.5%) were immunocompromised.

Treatment patterns

- 333 (97.7%) had at least one investigator visit (mean number of visits = 3.4). 8 patients were admitted directly to day-hospital.
- 267 outpatients cases (80.2 %) underwent at least one office-based procedure, mainly cryotherapy and electrotherapy.
- 124 patients (36.4%) were prescribed a self-applied therapy.
- 39 cases (11.4%) were admitted to day-hospital.
- 47 patients (13.8%) reported a medical complication related to GW treatment.

Table 3. *Patients undergoing treatments and number of interventions*

		Cases	Hospital admissions	Medications		Outpatient*					
						Cases	Visits	Examinations		Procedures	
		n	%	%	mean (days)	n	mean	%	mean	%	mean
Men	New	109	8.3	45.9	26.7	108	2.9	38.9	0.82	74.1	1.6
	Recurrent	38	0.0	55.3	39.2	38	4.8	55.3	1.11	89.5	2.8
	Resistant	42	4.8	35.7	36.4	41	4.3	39.0	0.71	95.1	2.7
	Total	189	5.8	45.5	31.5	187	3.6	42.2	0.86	81.8	2.1
Women	New	85	18.8	18.8	48.3	81	3.6	82.7	4.54	84.0	1.5
	Recurrent	43	25.6	30.2	51.2	41	3.9	85.4	4.8	78.0	1.7
	Resistant	24	20.8	37.5	32.2	24	3.1	95.8	4.29	58.3	1.0
	Total	152	21.1	25.0	45.5	146	3.6	85.6	4.58	78.1	1.5
Total		341	12.6	36.4	35.7	333	3.6	61.3	2.49	80.2	1.8

* Including investigator and other physicians

Sick leave

- 10 men (5.3%) and 30 women (19.7%) were on sick leave due to GW and their treatment; 8 patients (17.0%) were absent from work due to related medical complications.
- The annual mean number of days off work per patient was estimated to be 5.7 (±4.0 sd).

Cost analysis

- Mean direct medical costs per patient were **€242 for men** and **€332 for women**. When productivity losses are included, these costs were respectively **€325** and **€464** (Table 4).
- Visits and procedures were the main drivers of outpatient costs in men, whereas examinations and visits were the main components in women.
- Hospital admissions accounted for 47.7% of direct medical costs per patient.

Table 4. *Mean costs and 95% CI*

Costs	Men	Women	Total
Outpatient	132.04 (118.41-145.47)	167.20 (150.73-185.05)	147.71 (136.68-158.37)
Visits	*55.48 (50.82-60.28)*	*58.88 (52.85-60.02)*	*57.00 (53.51-60.80)*
Examinations	*13.08 (9.57-17.19)*	*64.08 (54.09-73.25)*	*35.82 (30.29-40.92)*
Procedures	*32.51 (27.81-38.24)*	*25.90 (22.25-29.56)*	*29.57 (26.17-32.83)*
Medications	30.96 (24.68-37.29)	18.34 (12.47-24.60)	25.34 (16.09-32.42)
Hospitalisations	110.43 (44.78-190.52)	164.75 (88.62-249.13)	134.65 (81.67-199.66)
Direct	**242.47 (176.14-325.89)**	**331.96 (253.99-425.35)**	**282.36 (230.73-342.57)**
Indirect	**82.26 (54.55-114.27)**	**132.39 (104.53-162.48)**	**104.60 (83.50-126.53)**
Total	**324.73 (248.15-418.00)**	**464.35 (383.52-559.30)**	**386.96 (327.20-451.17)**

Figure 1. *Cost composition (€)*

DISCUSSION & CONCLUSION

- This study is the first to identify therapeutic patterns and costs of GW in Italy.
- Treatment costs are in line with recent European estimates, ranging from €221 for outpatient services among men in the Netherlands[5] to €342 for women consulting gynecologists in France[2].
- Self-applied therapies are less widespread than in other European countries: 34% of newly diagnosed GW episodes are managed with patient-applied therapies, whereas in the UK 77% of incident cases are treated with topical creams[11], and in France 53% of all cases are given imiquimod[2].
- A quadrivalent HPV vaccine that prevents HPV 6,11,16,18 related diseases has the potential to significantly decrease the socio-economic burden associated with GW in Italy in a very short term[12]

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