

Nierdako-Iwanicka Barbara, Materna Jolanta. Pain level measured with visual analogue scale in patients with hirsutism or hypertrichosis undergoing depilation. *Journal of Education, Health and Sport*. 2018;8(7): 128-132. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.1288492> <http://ojs.ukw.edu.pl/index.php/joehs/article/view/5575>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part b item 1223 (26/01/2017).  
1223 Journal of Education, Health and Sport eissn 2391-8306 7

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The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 22.05.2018. Revised: 28.05.2018. Accepted: 13.06.2018.

## **Pain level measured with visual analogue scale in patients with hirsutism or hypertrichosis undergoing depilation**

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### **Abstract**

Smooth skin is an attribute of beauty. Hair is a skin appendage. Hirsutism affects 5-10% of the women.

There are different methods of excessive hair removal: with creams or foams, shaving, depilation, epilation, waxing, laser treatment or with use of tweezers.

The aim of the study was to assess pain level measured with visual analogue scale (VAS 0-10) in persons with hirsutism and hypertrichosis undergoing depilation.

An original questionnaire consisting of 7 questions was used as the tool for examining participants.

A total of 125 persons participated in the study. Among them were 106 women (84.8%) and 19 were men (15.2%).

Mean pain (mean  $\pm$ SD) due to depilation in women was 3.6 ( $\pm$  2.26 ;min. 0, max 10) and 3 ( $\pm$ 2.8; min. 0.6, max 9.0) in men.

Depilation is so painful for some patients, that some of them may require painkillers before it, but this issue should be discussed with the physician.

**Keywords: hirsutism, depilation, pain**

## Background

Smooth skin is an attribute of beauty. Hair is a skin appendage. Hirsutism affects 5-10% of the women. It is defined as the presence of hairs in females in a male-like distribution. Hirsutism is a marker of increased androgen levels in females from increased production of testosterone. The causes for hyperandrogenism are polycystic ovarian syndrome (PCOS), ovarian tumors, Cushing's syndrome, androgen-producing tumors, and congenital adrenal hyperplasia (CAH), most commonly due to 21-hydroxylase deficiency. Increased growth of hair in male pattern distribution is hirsutism, while generalized increase in growth of hair on all body is hypertrichosis [1,2]. Many men and women see themselves as ones with unwanted hairs in different body areas. Some are diagnosed by specialists as having hirsutism or hypertrichosis.

There are different methods of excessive hair removal: with creams or foams, shaving, depilation, epilation, waxing, laser treatment or with use of tweezers [3,4,5,6,7,8].

Pain is a highly unpleasant physical sensation caused by illness or injury [9]. Pain feeling process consists of transduction, transmission, modulation and perception. The nociceptive (potentially harmful) stimuli are received by receptors in the skin. Skin is highly innervated. There are endings of the autonomous and peripheral nervous systems. Nerve endings located in the skin allow us to feel touch, pressure, and temperature. Hair follicles are innervated with single and branching nerve endings and Vater-Pacini's bodies (for touch and pressure feeling), Meissner's bodies (for touch feeling especially on the fingers), Golgi-Mazzoni's bodies (feeling cold) and Ruffini's bodies (feeling hot) [10,11,12]. Stimulation of the nerve endings in the skin induces a change of the impulse into electricity, which is conducted via fast myelinated  $\delta$  fibers or slow not myelinated C fibers. After activation of the nociceptors the impulses run to poster roots. They are transmitted to upper levels of the central nervous system. They reach thalamus and brain cortex [13,14,15,16].

## Objectives

The aim of the study was to assess pain level measured with visual analogue scale (VAS 0-10) in persons with hirsutism and hypertrichosis undergoing depilation.

## Material and methods

A questionnaire consisting with 7 questions was used as the tool for examining participants. The questions were about: 1 gender, 2 age, 3 region of the body selected for depilation, 4 method of depilation chosen, 5 'is it your first depilation?', 6 VAS, 7 'were there any side effects of depilation? erythema, itching, rash, burn, infection, none, other?' Participation in the study was voluntary and anonymous. Participants were clients of two beauty parlours in Lublin in November and December 2017. A total of 125 persons participated in the study. Among them were 106 women (84.8%) and 19 were men (15.2%).

## Results

Among women 30 had eyebrow depilation, 20 moustache, 27 armpits, 22 hands, 12 bikini, 4 thighs, 16 shins, 15 all legs. Among men 1 had eyebrow depilation, 1 moustache, 4 armpits, 3

thorax, 2 bikini, 1 thighs, 1 shins, 3 all legs, 7 back. Some respondents had more than one area depilated on the same occasion.

Respondents could choose one of methods of depilation: with tweezers, sugar paste, soft waxing, hard waxing or laser.

Waxing with a hard wax was selected by 34% of women, laser 28.3%, tweezers 17.9 soft wax 17% sugar paste 2.8%. Among men laser depilation was chosen by 79%, sugar paste 10.5% and soft wax 10.5%.

Mean pain (mean  $\pm$ SD) due to depilation in women was 3.6 ( $\pm$  2.26 ;min. 0, max 10) and 3 ( $\pm$ 2.8; min. 0.6, max 9.0) in men. The most painful for women was depilation with sugar paste if done for the first time) with mean pain feeling VAS= 5.0 and the least laser therapy (mean VAS=2.8 ). If a woman has depilation done for the second time the most painful is soft waxing (VAS= 4.2) and the least if done with tweezers (VAS= 2.6). In case of men the first depilation is most painful when done with tweezers (VAS= 6.0) and least with sugar paste (VAS= 1.5). If done for the second time the most painful was soft waxing (VAS= 7.8) and the least done with a laser (VAS 2.5).

Side effects recorded by women were: after use of tweezers - erythema (5.3%), sugar paste - itching 33% and rash 33%, soft wax - erythema 20%, itching 10%, rash 20%, hard wax - erythema 36%, itching 5%, after laser therapy - erythema 7%, itching 3%, rash 3%. In men after depilation with tweezers - no side effects were reported, after use of sugar paste -50% reported itching, after soft waxing – 50% reported mild rash, after laser therapy 7% reported rash too.

## Discussion

Skin consists of epidermis, proper skin and subcutaneous tissue [17]. Proper skin is very innervated and sensitive to nociceptive factors, touch, hot and cold. Looking back at the history depilation of different parts of the body had an important cultural and sexual significance. Now we have dress codes in different companies. In ancient times there was a kind of 'hair and skin code' identifying tribe members and their social status [18]. On the islands on Pacific Ocean since the ancient times shark teeth were used for surgical and 'beauty' procedures like scarring and tattooing. For shaving sharp shelves were used [19]. There are reports that Egyptian queen Cleopatra was keen on depilation. In middle ages the care of beauty was neglected and forgotten for about one thousand years. Renaissance brought more attention to the look of human body. Development of cinema created stars who were idols of the public because of their perfect looks. Hair and skincare developed in order to change actress' hairline, hair color and remove unwanted hairs from the body.

In the XXth century a wide variety of razors, shaving machines, depilators, electrolysis, electrocoagulation, microlysis, ultrasound, waxing, sugar paste, tweezers and lasers became available for removal of unwanted hairs. With time the methods became available for the general public.

In 1895 Wilhelm Röntgen produced and detected an electromagnetic radiation known as X-ray [20]. In 1897 in Vienna there were trials conducted with use of X-ray for removal of unwanted facial hairs [21]. However, the method led to development of telangiectasiae and skin irritation and never became popular. In 2005 X-ray was classified as a carcinogen and its' use in treatment was limited to only selected types of cancer. New atomic law states what radiological protection is required to people exposed to X-ray [22].

Mańkowska et al. analyzed different effects of laser face depilation in women [23]. Authors concluded that permanent depilation (epilation) is more difficult to achieve when using facial laser treatment than in other parts of the body. Laser treatment is very popular now, after such treatment hair regrow at a slower rate and are thinner than after depilation performed with other methods, though it is expensive. In mass media there are numerous reports about side effects of laser therapy (most often burns). Other methods of depilation do not cause so many side effects, or the side effects are benign (rash, erythema, itching). In the present study itching and mild rash were the most often reported adverse events after use of sugar paste and erythema after use of hard wax in women. In men itching was present in 50% of men after depilation with sugar paste and mild rash after soft waxing.

It is difficult to find scientific publications about measuring pain or other adverse events accompanying depilation. In the present study authors focused on pain measured with VAS during depilation. VAS is more and more commonly used as a tool for measuring acute or chronic pain [11]. Depilation causes acute nociceptive pain. Pain >3 in the 0-10 VAS may require treatment [11]. However, personnel performing depilation has no right to prescribe any medication. The only treatment available in a beauty parlour is icepacks. Patients could use pretreatment with paracetamol or aspirin available over the counter, ointments or gels containing non-steroidal anti-inflammatory drugs, but there are reports about increased number of side effects after such treatment. Ultraviolet exposure may worsen the skin condition. Francuzik et al. described a phototoxic skin reaction to ketoprofen in gel [24].

## Conclusions

Some patients undergoing depilation may require painkillers before depilation but it should be discussed with the physician before treatment.

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