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The influence of breast hypertrophy on quality of life in women: a comparison between two study groups

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ABSTRACT

Background: Women's breasts are more than glands linked to breastfeeding, and represent a primary aspect of femininity and female sexuality. Twenty-seven patients with breast hypertrophy were selected and assigned to two groups, according to their breast hypertrophy classification. The SF-36 Questionnaire and BREAST-Q was applied to assess participants' quality of life. **Objective:** To determine the impact of breast hypertrophy on quality of life using the SF-36 questionnaire, and suggests that the relative impact on patient's quality of life can be used to recommend surgical versus non-surgical treatment. **Results:** In general, the results showed that the patients in group B reported a lower quality of life than those in group A. Moreover, The BREAST-Q demonstrated that the patients in the group B were less satisfied than in the group A. **Conclusions:** The SF-36 and BREAST-Q questionnaire, results showed that patients with breast hypertrophy grade III and IV had lower quality of life compared to patients of grade I and II. Therefore patients with breast hypertrophy grade I and II could benefit from non-surgical treatment.

INTRODUCTION

Women's breasts are more than glands linked to breastfeeding, and represent a primary aspect of femininity and female sexuality.

Breast hypertrophy, also referred to as hypermastia or macromastia is defined by the growth of mammary glands beyond physiological limits, and disproportionate to the female human biotype (Araújo *et al*, 2007; Porto *et al*, 2011).

Several methods are proposed to categorize breast hypertrophy, based on characteristics such as the brassiere size (Pitanguy, 1967; Pintagy and Salgado, 1999), the ratio of measurements between the thorax and the breast (Sacchini, 1991), the amount of breast tissue removed during surgery, and the intensity of the symptoms (Sector and Karp, 2007; Sector and Karp, 2008).

Among the benign changes which affect patients with breast hypertrophy (BH), we can highlight the following functional components: circulatory, respiratory and postural disorders. The most frequent complaint amongst patients is back pain, however, it is often difficult to assess, as several associated

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medical condition could also be contributing factors. These pains can vary from simple discomfort to pain that can keep the patient away from work (Fernandes, 2007; Bala, Kiran B., *et al*., 2016).

Some authors have reported neurological symptoms caused by the excessive size of the breasts, such as paraesthesia of the ulnar nerve, hand numbness and carpal tunnel syndrome (Klepetko *et al*, 2007; Kumar L. S, and Padmapriya, 2016). Furthermore, there are many studies discussing the psychosocial impact of BH on patients, such as low self-esteem, difficulties finding appropriately sized clothing, and the weakening of personal relationship and social life (Glatt *et al*, 1999; Akaneme, I. N., *et al*. 2016).

The aim of this study is to determine the influence of breast hypertrophy on quality of life using 36-item Short-Form Health Survey (SF-36) and BREAST-Q questionnaire, and suggests that the relative impact on patients' quality of life can be used to recommend surgical versus non-surgical treatment.

MATERIALS AND METHOD

Study Population:

We performed a study of 27 women with varying breast size, between the ages of 17 and 65 years old, carried out between January 2014 and November 2015. The study was conducted in the plastic surgery division of Centro Universitário do Espírito Santo - UNESC, and its protocol was registered and approved by the Institutional Ethics Committees of Unesc (Trial Registration 21102813.8.000. 5062). All patients provided written informed consent.

Participants were recruited by asking, all the women who sought treatment for hypermastia, to participate in the study. After the clinical evaluation, which was conducted by a medical student and a plastic surgeon, the women were allocated into two groups according to their classification of breast hypertrophy, based on Revueltas' criteria (Revueltas, 2002): Group A composed of 14 patients with classification I and II (medium and moderate); and Group B of 13 patients with classification III and IV (severe and gigantomastia). The inclusion criteria included women with breast hypertrophy, with a good understanding of the Portuguese language, and signed consent. Exclusion criteria were applied to women who did not have breast hypertrophy, refused to be interviewed, or were younger than 17 years, severely ill patients, women who were legally incompetent, had a history of breast surgery, or who underwent reduction mammoplasty during the study.

Methods:

As outcome measures, participants answered a standard questionnaire, and two health related quality of life questionnaires (SF-36 and BREST-Q), in the form of interviews. All interviews and physical examinations were conducted by a single nominated medical student and supervised by the same cosmetic surgeon.

The first contact with the patient, happened at plastic surgery division of UNESC. This was conducted a face-to-face interview, involving a SF-36 questionnaire and a standard questionnaire, followed by a physical examination.

The BREST-Q was carried out six months after the first contact. Each patient was contacted via telephone and asked to consent and participate in answering the BREST-Q questionnaire.

The standard questionnaire, was developed from a literature review of breast surgery outcome instruments. It was designed to determine the demographic information and subjective criteria. The demographic information requested was type of employment, education level, marital status, age, and cellphone number. The subjective criteria included questions about patients' self-perception of whether the they thought that the size of the breast increased after starting to take the contraceptive pill, breastfeeding, or after the presence of multiparity; and if they had any family history of breast hypertrophy.

A physical examination was performed to assess the signs and symptoms, which include intertrigo, stretch marks, scapular depression, trapezius muscle hypertrophy, brassiere strap grooving, and degree of hypertrophy. All the examinations were taken in a normal standing position with the shoulders back and the head facing straight ahead. Abdominal circumference was measured at the level of an imaginary horizontal line at the midway region between the lowest rib margin and the iliac crest (Heyward *et al*, 1996; Nowrouzim Fatemeh, 2016; Yee, KhorEan, *et al*., 2015).

The SF-36 questionnaire, is composed of 36 questions that measure eight areas of quality of life (Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role-Emotional and Mental Health), summarized into two components: physical and mental. The scores of the scales are translated into values of 0 (worst quality of life) to 100 (best quality of life). The questionnaire was previously translated, culturally adapted and validated for the Brazilian population (Ciconellil, 1999).

The BREAST-Q patient-reported outcome instrument is designed to gauge the impact of quality of life in woman with mammary hypertrophy, from the patient's perspective. The BREST-Q reduction module (pre-operative) consists of four scales which includes; satisfaction with breasts, psychosocial well-being,

sexual well-being and physical well-being. The score from each scale is transferred onto a 100-point scale. Thus, each scale displays a score from 0 (very dissatisfied) to 100 (very satisfied). The questionnaire was translated and validated in accordance with the agreement with the MAPI Trust (http://www.mapi-trust.org/).

Statistical Analysis:

Analysis was performed using the Statistic Package for Social Sciences (SPSS® for Macintosh). Data is expressed in means with standard deviations (SD) or in frequencies with percentages (%). The Students T-test was utilized to compare age, body mass index (BMI), and abdominal circumference (AC) between both of the groups. The BREAST-Q and SF-36 domain were analysed using the Mann-Whitney U test in order to compare any potentially existing differences between data obtained for score of each groups. Furthermore, the results of the physical and mental components summary, in SF-36 questionnaire, were obtained using SF-36 PCS calculator, MCS and NBS. All statistical tests were performed at a significance level of 0.05 ($p< 0.05$).

Results:

The mean age for all the woman was 42.62 ± 13.3 years. Patients demographics are presented in table 01. We noticed no statistically significant difference between assessed regarding age, BMI and AC.

On physical examination, the patients had intertrigo (29.62%), stretch marks (51.85%), scapular depression (55.55%), trapezius muscle hypertrophy (70.37%) and brassiere strap grooving (92.59%).

The percentage of the patients who reported breast growth after starting to take the contraceptive pill was 22%; 62.96% following breastfeeding; 59.25% after the presence of multiparity; and in 62% of cases there was a family history of breast hypertrophy. The comparison between the patients' self-perception about the influence of all these factors with breast growth, did not demonstrate a significant correlation between group A and B ($p> 0,05$).

The results of the SF-36 (Table 2) showed that the patients in group B had a decrease in quality of life when compared with group A. Furthermore, the BREAST-Q demonstrated that the both group were satisfied with psychosocial well-being, but, overall, the patients in the group B were less satisfied than in the group A (Table 3).

Table 01: Patient Demographics

	Group A, Mean (SD)	Group B, Mean (SD)	PValue, t-Test
Age, years	39.28 (12.7)	46.23 (11.60)	0.253764
BMI, kg/m²	32.26 (5.40)	31.12 (4.68)	0.467811
AC, cm	100.35 (11.6)	105.3 (10.4)	0.400999
BMI, body mass index; SD, standard deviation; AC, abdominal circumference.			

Table 02: Descriptive Measures of Eight Domains of SF-36

Domains	Group A, Mean (SD)	Group B, Mean (SD)	PValue, Mann-Whitney test
Physical Functioning	68.92 (11.2)	37.69 (9.9)	0,0056
Role-Physical	69.28 (21.1)	34.61 (8.7)	0,00307
Bodily Pain	63.71 (12.4)	34.92 (15.7)	0,000
General Health	64.64 (9.7)	40.61 (7.8)	0,00028
Vitality	64.28 (10.1)	43.46 (14.8)	0,0056
Social Functioning	68.72 (14.3)	49 (10.5)	0,09692
Role-Emotional	83.43 (18.7)	38.45 (11.2)	0,00188
Mental Health	73.5 (11.1)	51.69 (13.2)	0,0008
Physical Component Summary	56 (10.2)	32.3 (9.7)	0,0094
Mental Component Summary	52 (9.8)	35.5 (10.6)	0,0082
SD, standard deviation; SF-36, Medical Outcomes Study 36-Item Short Form Health Survey.			

Table 03: Mean BREST-Q Patient-Reported Scores

Domains	Group A, Mean (SD)	Group B, Mean (SD)	PValue, Mann-Whitney test
Satisfaction with breasts	69,42 (15.7)	25.38 (10.1)	0,0032
Psychosocial Well-being	73,42 (13.5)	63.92 (9.8)	0,0839
Sexual Well-being	69,35 (16.2)	41,3 (10.3)	0,0090
Physical Well-being	75.07 (14.3)	28.76 (11.2)	0.0001
SD, standard deviation.			

Discussion:

Several studies have assessed the functional capacity of women with breast hypertrophy using different instruments, such as the Stanford Health Assessment Questionnaire-20. These studies proved that a high percentage of women with breast hypertrophy had a reduced ability to work, and worsening capacity for physical activities such as housework, daily activities (e.g. reaching for objects) and personal care (e.g. eating, personal hygiene and dress) (Raispis *et al*, 1998). One of the few previous studies assessing the impact of breast hypertrophy on quality of life using SF-36 questionnaire, by Carolyn (Carolyn *et al*, 2001), also found a diminished quality of life across eight domains.

This study found that a common feature in patients with breast hypertrophy is a high BMI. The mean BMI of the patients in this study was 32.26 kg/m2, which would classify them as having class I obesity. This feature tends to be even more pronounced in patients with severe hypertrophy. This may be due to breast size being a significant factor in increasing weight. As a consequence these patients have physical and emotional discomfort that limits their physical activities (Blomqvist *et al*,1996; Cerrato *et al*, 2012; Wolfswinkel *et al*, 2013).

An unexpected result of the study was that no significant relationship between hypermastia and breastfeeding, contraceptive use or multiparity, was found. This differs from other studies that demonstrate that as breast growth is hormone dependent, these factors which cause an increase in estrogen and progesterone levels, or hypersensitivity of these hormone receptors, can result in extreme breast growth (Gonzalez *et al*, 1993; Alexandretti *et al*, 2008; Sharifimoghadam Mahdi, Zamanian Fraezeh and Vesalinaseh, 2014).

The concept of quality of life is moving to the evaluation of health outcomes through standardized instruments (Ferraz, 1998). The patient's perception in relation to the impact of a disease, or its respective treatment on their life, is being recognized as an important indicator of quality of life in clinical and epidemiological research (Guyatti *et al*, 1993; Makzan, Banafsheh. 2014). The SF-36 and BREAST-Q are the most widely adopted questionnaires for measuring quality of life, and are sensitive to the potential impact of breast reduction on the patients' quality of life (Chao, 2002; Blomqvist, 1996).

In this study, the overall SF-36 and BREAST-Q scores found in group B were lower than group A, showing that the degree of breast hypertrophy had a direct impact on patients' physical and mental wellbeing. This can be seen in patients having greater difficulty carrying out their daily functions and social relations. Thus, patients with decreased functional capacity as a result of breast hypertrophy would not only have greater relief from symptoms following breast reduction (Klassen *et al*, 1996), they would also experience improvements in their capacity in all aspects of life.

In group B, the BREAST-Q showed that the patients were less satisfied with their breasts than in group A. This is supported by the SF-36 questionnaire, which also showed lower scores for the Role-Emotional domain for group B. In contrast, patients in group A demonstrated high values for the Role-Emotional domain, which demonstrates they were satisfied with their breasts. This strengthens the hypothesis that patients with lower hypermastia (group A) tend not to treat their condition as a deformity (Blomqvist and Branderg, 2004; Veiga *et al*, 2004; Freire *et al*, 2004; Freire *et al*, 2004; Beraldo *et al*, 2014).

Another finding identified in this study is the negative impact of breast hypertrophy on patients' mental wellbeing. Mental health is related to the perception of anxiety or depression, which can result in problems associated with daily or professional activities. Therefore, the presence of a lower score in group B shows that patients are aware of their anxiety which can cause serious problems in their lives. Such depressive manifestations can result in sexual dysfunctions that cause damage to their relationships and problems in other aspects of your life such as anxiety (Araujo *et al*, 2014).

The scores for the Sexual Well-being domain in BREAST-Q, demonstrated that group B was less satisfied than group A in aspect of their quality of life. This may be a result of breasts that are hypertrophic

having an appearance that is frequently disliked by patients. As the result the large size, breasts can have a flat upper pole and varying degrees of ptosis due to their weight (Saariniemi *et al*, 2011; Cerrato *et al*, 2012; Coriddi, 2013).

For the SF-36 questionnaire domains of Physical Functioning, Role-Physical and General Health, the results were consistent with the literature. This is because patients with a higher degree of breast hypertrophy have difficulty performing their daily tasks or professional activities due to physical limitation (Iwaugwu *et al*, 2006).

The results for Physical Well-being, in BREAST-Q, were consistent with those for physical domains in the SF-36 questionnaire. This study found that the patients reported severe breast-related symptoms such as back, neck, and shoulder pain, difficulty exercising, and difficulty finding correctly fitting clothes (Cha, 2013; Elthahir *et al*, 2013; Wolfswinkel *et al*, 2013).

The Social Function and Psychosocial Well-being domains did not highlight any significant difference between group A and B. In other words, individuals in groups B did not feel deprived of performing their normal social activities because of their physical or emotional condition. There was no statistically significant difference in this domain between the two groups. This is likely due to the patients in group B selecting social activities that did not cause them major difficulties, which is a consequence of a self-defense reaction that occurs during adolescence (Valtonen *et al*, 2014; Vasugi P, Yoganand. Mr. S. 2016).

Besides the physical and emotional aspects, another common complaint, which was not evaluated in this study, is the aesthetics aspect. This makes it difficult in clinical practice to prescribe breast reduction, because of the existence of a tenuous line that separates real needs from purely aesthetic reason; and means the health insurance providers and Unified Health System (SUS), do not cover this procedure (Coriddi *et al*, 2013; Jothi, 2016).

However, treatment of breast hypertrophy is not merely aesthetic, because the fundamental criteria for surgery to improve the quality of life in patients, is the same for patient who receive breast reduction (Valtonen *et al*, 2014; Ilyas *et al*, 2016). This is evidenced by further studies demonstrating that breast reduction improves quality of life measured by the SF-36 in all eight domains, suggesting that surgery is not "whim" or simply feminine vanity (Kececi and Gungor, 2014; Beraldo *et al*, 2014)

Conclusions :

This study provides strong evidence that patients with breast hypertrophy degree III and IV should preferably be treated with breast reduction. Patients with greater breast volume should have higher priority with regards to accessing surgical treatment, because the quality of their life is significantly diminished by their condition.

On the other hand patients with hypertrophy degree I and II, may benefit from a combination of conservative treatments, including nonsterioidal anti-inflammatory medication, physical therapy or chiropractic care, home exercise in rehabilitation, and intertrigo treatment, among others. Although they still had many complaints, they displayed a higher quality of life and greater satisfaction with their breasts than those with degree III and IV.

Furthermore, the SF-36 questionnaire and preoperative BREAST-Q can become an additional reference for prescribing breast reduction treatments, as well as a measurement of the benefits that investment in these treatments could bring, and factor in decision-making regarding the distribution of funds in the health system.

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