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Can the efficacy of reduction mammoplasty be predicted? The applicability and predictive value of breast-related symptoms questionnaire in measuring breast-related symptoms pre- and postoperatively☆

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Summary To measure the impact of reduction mammoplasty, the Breast-Related Symptoms Questionnaire (BRSQ) was translated into Finnish and tested among women seeking reduction mammoplasty. This previously validated questionnaire focuses on 13 breast hypertrophy-related symptoms and their frequency. In this prospective multicentre study, the breast-related symptoms of 98 women were measured preoperatively with BRSQ and the health-related quality of life (HRQoL) with the 15 dimension (15D), a well-established generic tool. A total of 59 participants were followed up at least 6 months postoperatively. The women were middle-aged (mean age 44 years) and most of them overweight (mean Body mass index (BMI) 29). All patients had frequent physical symptoms and disability due to their breasts and reported low breast severity symptom score (BSS mean 27, range 13–38). Mean amount of resected breast tissue was 1310 g per patient. Postoperatively, the breast-related symptoms were significantly relieved, and 55 of 59 operated patients reported less frequent or non-existent symptoms (mean BSS 59, range 22–65). BSS score improved especially in obese women and those with pendulous breasts. A low preoperative BSS was related to considerable benefit from surgery. HRQoL score improved significantly from 0.889 to 0.930 ($P < 0.001$) and

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significant improvement was seen especially in dimensions, such as discomfort, usual activities and breathing.

In conclusion, BRSQ is an easy tool to use to quantify breast-related symptoms. It visualised effectively the impact of the reduction mammoplasty. Surgical breast reduction significantly improves breast-related symptoms and the HRQoL among women with many breast-related symptoms. The present guidelines for patient selection in breast reduction surgery should be updated to use valid measurement and scientific evidence.

Breast hypertrophy causes pain, reduced functional capacity and low self-esteem leading sometimes to pain medication, sick leaves and reduced quality of life. The severity of symptoms may correlate with the size of the breasts, but it is not always the case.[1,2] Reduction mammoplasty reduces the size of the breasts by excision of breast parenchyma and the ptosis by skin resection and/or parenchymal sutures. The relief of neck and shoulder pain is related to decreased weight and possibly also to the decreased pendulous nature of the breasts. Multiple studies prove that breast reduction is an effective surgery, and more than 90% of the operated patients experience a decrease in symptoms or become asymptomatic.[3–9] By contrast, patients treated conservatively, for example, with pain medication or physiotherapy do not experience decrease in symptoms.[2]

In 2004, uniform criteria for access to non-emergency care were compiled as a part of the National Health Care Project in Finland. Uniform indications for the surgical treatment of breast hypertrophy were established by a group of practising specialists in plastic surgery.[10] Three variables were taken into account: the sternal notch—nipple length (SNNL), the presence of neck and shoulder pain and the patient's functional capacity. In addition, the fourth variable, body mass index (BMI) is used with a negative impact on the sum of other variables. This set of criteria was based on clinical experience of good patient selection rather than scientific evidence. Some problems have been reported when using the Finnish system, for example, a long SNNL in ptotic breasts scores high enough to indicate surgery. At present, some conflict is evident between this guideline and the present knowledge about the impact of reduction mammoplasty.

As in all surgery, breast reduction surgery should be targeted at the group of patients who are symptomatic because of their breast size and because they would most probably benefit from the operation. For this purpose, some tools have been previously developed. In this study, the aim was to evaluate the applicability and predictive value of the Breast-Related Symptoms Questionnaire (BRSQ), a questionnaire of 13 questions defining breast-related symptoms.[11] In addition, we wanted to measure health-related quality of life (HRQoL), and for this we used the well-established questionnaire instrument 15 dimension (15D).[12] Our goal was to accurately measure and quantify pre- and postoperative general and disease-specific symptoms in patients with macromastia, compare clinical findings with symptoms and, ultimately, define the impact of breast reduction surgery using patient-reported outcome tools.

Patients and methods

This was a prospective, multicentre study carried out between the years 2008 and 2010. The ethical approval of the study was obtained from the Research Ethics Committee of Kuopio University Hospital. For this study, BRSQ questionnaire was translated into Finnish. Patients were recruited from six Finnish hospitals that offer plastic surgical services for public health-care patients, admitting the patients to be evaluated for surgical treatment of symptomatic macromastia. Their clinical evaluation was done by a plastic surgeon or a resident in plastic surgery and during this visit, the patients were asked to participate in the study. After a written informed consent, the patients filled out the two questionnaires, BRSQ and 15D, either during the outpatient visit or latest at the time of the hospital admission for surgery. Ninety-eight patients were recruited to the study. The patient history, symptoms, clinical findings and body and breast measurements were registered into the patient chart. A total of 88 patients were operated during the study, and in these patients, the operative technique used and the amount of resection were registered. The postoperative follow-up was carried out by mailing the same questionnaires 6—12 months postoperatively to the patients. Out of the 88 operated patients, 64 responded (73%).

Each of the 13 questions in BRSQ was separately evaluated (Table 1). In addition, a summary score (BSS = breast severity symptom score) was calculated by scoring the symptom frequency of all symptoms (all of the time = 1 point, none of the time = 5 points). Another score, physical symptoms count (PSC), was calculated from seven physical symptoms and their frequency. HRQoL was measured using the 15D questionnaire (Table 2). It is a generic, standardised, self-administered instrument and can be used both as a profile and as a single index score measure. The respondent must choose one of the five levels that best describes his/her state of health at the moment (the best level = 1, the worst level = 5). The valuation system of the 15D is based on an application of the multi-attribute utility theory. A set of utility or preference weights, elicited from the general public through a three-stage valuation procedure, is used in an additive aggregation formula to generate the utility score, i.e., the 15D score (single index number)