Patients are more satisfied than they expected after joint arthroplasty

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The aim of this study was to compare the preoperative patients' expectations with their postoperative satisfaction after arthroplasties of the hip and knee, using a visual analogue scale. The comparison was made in a group of 44 patients after 44 primary knee and hip joint arthroplasties. A visual analogue scale (VAS) was used for the assessment of expectation and satisfaction. The mean preoperative expectation VAS was 14.8 (SD : 14.3). The mean patient satisfaction at time of follow up was 13.0 (SD : 21.1). We found no agreement in the preoperative patient's expectation satisfaction versus postoperative satisfaction (p = 0.66). Moreover in our study, the patients expected to be less satisfied than they actually were at follow-up, which is shown with the Bland and Altman method. It appears that patients are not capable of predicting the outcome of the joint arthroplasty, which could be influenced by negative preoperative information on complications and risks. Pain and functional disability are probably the most important factors for the patients' satisfaction after arthroplasty surgery.

Keywords : satisfaction ; expectation ; arthroplasty ; visual analogue scale ; outcome.

INTRODUCTION

The quality of life for patients with osteoarthritis has been dramatically improved by arthroplasty [14,16]. The patients' satisfaction after a medical treatment is becoming increasingly important in our modern health care, because the health care system is shifting towards a market model. Patients' satisfaction leads to a greater compliance, which will be leading to a better follow-up and longevity of the prosthesis [9]. Satisfaction with the outcome of a joint arthroplasty is a complex item and is affected by many factors [3,9]. Studies showed that the patients' expectation was the most important factor in patient satisfaction [9,13]. Lubbeke *et al* [10] also mentioned that better information and medical preparation before surgery may help to improve the success of revision surgery. This was also found in the study of Manusco *et al* [11], where the patients were more satisfied with the outcome of arthroplasty, when the preoperative expectations had been met. It is quite

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difficult to measure patient expectations, because there is no standardized scale available for this factor. In this study we used a simple visual analogue scale (VAS) to compare patient preoperative expectations with the patient's satisfaction in hip and knee arthroplasty. The purpose of this study was to investigate if the patients' expectations about the result of an arthroplasty were the same as their satisfaction at follow-up.

PATIENTS AND METHODS

Between January 2003 and January 2004, 44 primary arthroplasties were performed by one surgeon (CJMvL) in 44 patients (31 female, 13 male). Patients were randomly asked to participate. Exclusion criteria were dementia, revision surgery and rheumatoid arthritis. No patients were lost to follow-up. The 44 arthroplasties consisted of nine Charnley Elite Plus total hip arthroplasties (THA) (DePuy/Johnson & Johnson, Leeds, UK), 17 LCS total knee prostheses (TKA) (DePuy/Johnson & Johnson, Leeds, UK) and 18 unicompartimental Oxford knee arthroplasties (Biomet, Indiana, USA). The mean age of the patients at the time of operation was 68 years (range 52-81 years). The mean follow-up was 13.1 months (range 11.2-20.1 months). In the outpatient department the patients were seen by the surgeon pre-operatively and were asked to participate in the study. All the patients agreed to comply with the protocol. Patients were informed about the operation, possible complications, and the postoperative rehabilitation with an instruction video. They were also informed about the operation, complications and risks by a nurse practioner and an orthopaedic surgeon. At that moment the patients filled out the Western Ontario McMasters Universities Osteoarthritis Index (WOMAC) and they scored their preoperative pain at rest, pain during activity and expectations about the arthroplasty on a simple VAS tool without the presence of the surgeon (1,4,15,16). Thereafter the orthopaedic surgeon took the history and performed the physical examination. He determined the Knee and Function Scores based on the Knee Society Clinical rating system (KSCRS), or the Merle d'Aubigné (MAS) and Harris Hip score (HHS), depending on the involved joint. Subsequently he reviewed the preoperative radiographs and scored his preoperative expectation of the outcome after an arthroplasty on a visual analogue scale (5,6,12). The orthopaedic surgeon had no information about the patient expectations of the arthroplasty. At the time of follow-up the patients filled

out the postoperative WOMAC, and they also scored their pain and satisfaction on a VAS in a different room without the presence of the orthopaedic surgeon. Subsequently the orthopaedic surgeon performed a physical examination and determined the postoperative KSCRS, or MAS and HHS. Thereafter he reviewed the follow-up radiograph and scored his satisfaction on a simple VAS tool, without knowledge of the forms scored by the patients.

Clinical scoring systems

The orthopaedic surgeon scored the objective clinical data using the KSCRS, MAS and HHS (5,6,12). The KSCRS consists of a knee score for pain, stability, and range of motion, with deductions for flexion contracture, extension lag, and malalignment, and a functional score for assessing walking and stair climbing, with deductions for walking aids (6). The MAS and HHS are two objective clinical hip scores, which were obtained preoperatively and at time of follow-up.

WOMAC

The WOMAC-index is a well tested self-administered health questionnaire specifically designed for patients with OA of the hip or knee. The WOMAC consists of three dimensions divided in a total of 24 items : WOMAC pain (5 items), WOMAC stiffness (2 items) and WOMAC physical function (17 items). The questions are ranked on a 5 point (none, slight, moderate, severe, extreme) Likert scale. The scores are added up for each category. To facilitate comparisons between the WOMAC scores and the VAS scores, the WOMAC scores were transformed from 1 (best) to 5 (worst) points in each item to a system of 0 (best) to 100 (worst) points per subscale (1,14).

Pain visual analogue scale

The pain at rest and during activity at the hip/groin or around the knee was obtained using the VAS system. The scale consists of a 100-mm-long horizontal line ranging from 0 mm (indicating no pain) to 100 mm (indicating intolerable pain). These numbers of mm were converted in the same number of points (4,15).

Expectations and Satisfaction visual analogue scale

Preoperatively, the expectation of the arthroplasty was assessed using a VAS system. The patients were

asked to quantify their expectation regarding the overall outcome (satisfaction) of the arthroplasty on a simple VAS. The VAS system was similar to the VAS system used for pain. But now the 0 mm indicates the highest expectation and 100 mm indicates no or the worst expectation. The satisfaction was obtained at time of follow-up using also a VAS system, where 0 mm indicates complete satisfaction and 100 mm indicates total dissatisfaction. The number of mm was converted into the same number of points.

Statistical analysis

The agreement in expectation before and satisfaction after joint arthroplasty of the patient and surgeon was measured using the Bland and Altman method (2). The Spearman correlation test was used to measure the correlation between the pre-operative expectation and post-operative satisfaction of the patient and surgeon. The paired t-test was used to compare the pre-operative and postoperative WOMAC, HHS, pain VAS at rest and during activity. Significance was set at $p < 0.05$.

RESULTS

Clinical scoring systems

The mean knee score increased from 45.3 (SD 10.9) to 90.9 (SD 13.5) and the mean function score increased from 55.4 (SD 15.5) to 76.6 (SD 23.1).

The mean HHS increased from 51.6 (SD 11.0) to 85.6 (SD 12.3) en the mean MAS increased from 10.7 (SD 3.2) to 15.9 (SD 2.9) for the patients with THA (n = 9).

Analysis of VAS

The mean preoperative expectation VAS was 14.8 (SD 14.3). The mean patient satisfaction at time of follow up was 13.0 (21.1). Twenty-nine of the patients thought their satisfaction after the joint arthroplasty was excellent or good (VAS < 20), which is 65%. Thirty-seven of the patients scored excellent or good satisfaction (VAS < 20) at time of follow-up, which is 84%.

The mean preoperative surgeon's expectation was 9.2 (SD 10.4). The mean follow-up surgeon satisfaction was 11.6 (SD 16.0). The surgeon thought that 38 patients would have an excellent or good satisfaction after total joint arthroplasty, which is 86%. The postoperative surgeon satisfaction was excellent-good for 37 patients, which is 84%.

The mean preoperative pain VAS at rest and during activity was 35.3 (SD 21.4) and 64.3 (SD 21.2) respectively. The mean follow-up pain VAS at rest and during activity decreased to 10.9 (SD 16.9) and 20.6 (SD 21.5) respectively.

WOMAC

The total WOMAC score increased from 47.9 (SD 14.4) preoperatively to 73.2 (SD 21.7) at time of follow up. The three subscales of the WOMAC score, i.e. pain, stiffness and physical function also increased at time of follow-up. The values of the WOMAC scores are shown in table I.

Statistical analysis

The mean difference between the pre-operative expectation of satisfaction and the follow-up satisfaction was 13.9 (C.I. -10.8 to 38.6). The Bland and Altman method showed that there was no agreement in the preoperative patient and surgeon expectation and the follow-up satisfaction (fig 1 & 2). The Spearman correlation coefficient between the expectation of satisfaction before the arthroplasty and the follow-up satisfaction was -0.03 and 0.06 for patient and surgeon respectively. The paired t-test showed a significant difference between the preoperative and the postoperative WOMAC, pain VAS at rest and during activity, HHS and KSCRS.

DISCUSSION

Arthroplasty increases the quality of life dramatically (7). The number of arthroplasties increases every year, because younger, more active patients are undergoing an arthroplasty. This may lead to higher patient's expectations. Over the past few years there has been more emphasis on the satisfaction of the patients after arthroplasty. Satisfaction is a complex item, which is affected by

Table I. — Preoperative and follow-up clinical and subjective scores

	Preoperative	Postoperative
KSCRS total	100.7 (Sd 18.4)	167.5 (Sd 31.8)
Knee score KSCRS	45.3 (Sd 10.9)	90.9 (Sd 13.5)
Function score KSCRS	55.4 (Sd 15.5)	76.6 (Sd 23.1)
HHS	51.6 (Sd 11.0)	85.6 (Sd 12.3)
MAS	10.7 (Sd 3.2)	15.9 (Sd 2.9)
WOMAC total	48.3 (Sd 17.1)	75.1 (Sd 24.6)
WOMAC pain	48.0 (Sd 21.1)	67.0 (Sd 24.4)
WOMAC stiffness	47.8 (Sd 14.9)	73.3 (Sd 21.7)
WOMAC Function	47.9 (Sd 14.4)	73.2(Sd 21.7)
Patient expect vs satisfact	14.8 (Sd 14.3)	13.0 (Sd 21.2)
Surgeon expect vs satisfact	9.2 (Sd 10.4)	11.6 (Sd 16.0)
Pain VAS at rest	35.3 (Sd 21.4)	10.9 (Sd 16.9)
Pain VAS activity	64.3 (Sd 21.2)	20.6 (Sd 21.5)

many factors, especially the expectations before the surgery (*9*). Previous studies showed that the patients' expectation was the most important factor in patient satisfaction (*13*). A limitation of our study is the limited number of patients involved and the relative heterogeneity of the study group. Hip and knee patients were combined. However the aim of the study was not to evaluate one implant but to compare preoperative patients' expectation of satisfaction with their actual satisfaction at one year follow-up. In our study we used a simple VAS, where the patients were preoperatively asked to quantify their expectations regarding overall satisfaction with the total joint arthroplasty. We compared this with the satisfaction VAS at 1 year follow-up. The patients were operated and evaluated by one orthopaedic surgeon (CJMvL), thereby eliminating a bias caused by multiple surgeons. We found no agreement in the pre-operative patients' expectation versus the follow-up patient's satisfaction (fig 1). However, 84% of the patients expressed excellent or good satisfaction (VAS < 20), which was higher than their pre-operative expectation of satisfaction, as only 65% of them expected excellent/good expectation satisfaction (VAS < 20). This means that the patients are not capable of predicting the outcome of the arthroplasty. Moreover, in our study the patients expected to be less satisfied than the overall follow-up satisfaction. Noble *et al* (*13*), suggest that patient's expectations will strongly influence their interpretation of the out-
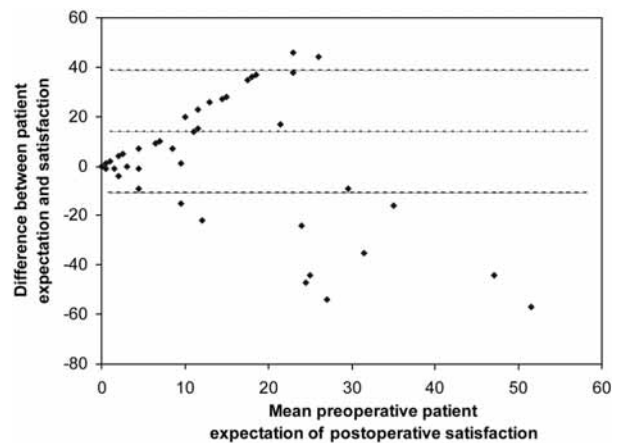

Fig. 1. — Bland and Altman method showed no agreement between preoperative patient expectation of satisfaction and 1 year follow-up patient satisfaction.

come of their joint replacement and their ultimate satisfaction. They also found that the satisfaction of a TKA is primarily determined by patients's expectations and not by their absolute level of function (*13*). It has also been shown that the patients' expectations and reasons for undergoing THA can change over time, which can influence their perception on satisfaction with the procedure over time (*8*). The change in expectations of a joint replacement could be a reason that the patients scored a higher postoperative satisfaction in our study. Another reason could be that the preoperative information on complications and risk factors
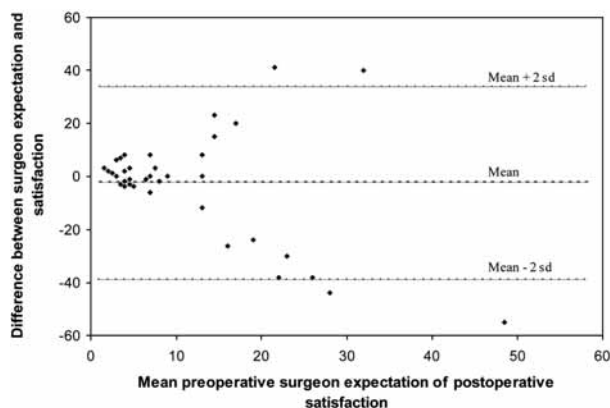
Fig. 2. — Bland and Altman method showed no agreement between preoperative surgeon expectation of satisfaction and 1 year follow-up surgeon satisfaction.

are too negative, which could lead to a lower preoperative expectation of satisfaction on the part of the patients. The patients who scored a relatively low expectation of satisfaction were relatively more satisfied at time of follow-up. The surgeon was also unable to predict the degree of satisfaction with the arthroplasty, which was shown by the low correlation between the preoperative expectation of satisfaction and the follow up satisfaction (r = 0.06). It's quite difficult to predict the patients thoughts, pain and quality of life pre-operatively and at time of follow-up leading to a difference in surgeons expectation and satisfaction. Satisfaction is a complex item, which is influenced by many factors, including expectation but also pain, functional disability and quality of life. Pain and function disability are probably the most important factors for patients' satisfaction in arthroplasty surgery (*3*).

In this study we found that the patients are more satisfied than they expected to be after hip or knee arthroplasty. The purpose of an arthroplasty is to improve the quality of life and many studies showed that quality of life indeed improved dramatically. The follow-up VAS satisfaction in our study could be a simple tool to measure the patients' quality of life after a joint arthroplasty.

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