

Prosthetics School Importance of Patient Education Prior to Prosthetic Hip and Knee Surgery

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Abstract

Introduction: Discovering the potential benefits of conducting an informative group session prior to prosthetic hip and knee surgery. The contents of this session were agreed upon by Orthopaedic and Trauma Surgery, Rehabilitation, Physiotherapy and Nursing. The contents and the organizational format for this session at the Hospital de Denia are described.

Materials and Methods: Patients awaiting prosthetic knee and hip surgery were randomly divided into two groups. The study group (n=23) was invited to an information session prior to their surgery. The control group (n=23) followed the usual protocol that consist on receiving general information about de procedure in the outpatient clinic. Pain, degree of satisfaction, knee mobility, and start of ambulation and days of hospital stay were recorded.

Results: Forty six patients were included. Patients from the study group had a greater degree of satisfaction (100% satisfaction of 9/10), began walking sooner and had a shorter hospital stay than the control group. A rapid decrease in pain was recorded in the study group, reaching levels significantly lower than those of the control group as of the second day.

Conclusions: In prosthetic joint surgery, educating patients increases their satisfaction and reduces their hospital stay. Thanks to this study, the prosthetics school has been routinely established in our hospital with a high degree of satisfaction for the patients, family members and professionals involved.

Keywords: Clinical pathway; Arthroplasty; Educational programme; Prosthetics school; Pain; Anxiety; Patient education

Introduction

The number of hip and knee arthroplasties is currently undergoing a steady increase worldwide, due to the aging population and the increase in functional demands in old age. As health professionals, optimization of the results of our clinical practice requires us to reduce the variability in clinical practice, improve safety in patient care, optimize the use of the resources associated with the procedure, increase the quality of care through a process of continuous improvement and increase patient satisfaction, with the objective of obtaining excellent results with early functional recovery and a short hospital stay. The Hospital de Denia attends to a population of approximately 150,000 inhabitants.

The current economic climate and healthcare budgets that are increasingly more limited, call for devising new management models more efficient to achieve shorter hospitalizations in order to minimize healthcare costs and Increase the quality perceived by the patient. The introduction of clinical pathways and protocols has provided the majority of this optimization of resources, which include a variety of actions centred on the surgical act, in order to both fulfill patient expectations and achieve these objectives.

The factors that are directly dependent on the surgeon such as the surgery itself or the implant option are a basic part of this process; however, the interrelationship with the patient is one basic part, often forgotten or left to other professionals, which will allow us to optimize results in terms of patient satisfaction and healthcare quality. In order to achieve this optimization, multidisciplinary work units or teams were created some time ago, which, in the case of lower limb arthroplasty, are based at our centre on the interrelationship between the patient and the surgeon and rehabilitating physician who form the medical team and the nursing and physiotherapy team. The education of the patient with regard to the procedure that he or she will undergo is fundamental. Information issues with regard to both patients and professionals prior to surgery allow for feedback that helps with the surgeon's planning of surgery and the hospital stay, and evidently decreases patient anxiety.

In a meta-analysis, Van Herck [1] includes all aspects to be dealt with in clinical pathways, in the process prior to surgery, in surgery itself, and post-surgery, and concludes that, although they do not affect clinical effects, there is sufficient evidence that clinical pathways are an effective tool to improve the course of the medical procedure and financial costs, as well as patient quality of care and the efficiency thereof. Berend [2] affirms that one of the easiest and safest ways to increase efficiency in an arthroplasty procedure is by providing a high level of education and training to the patient and his or her family

during the perioperative period. Preoperative patient education has been included in several hip and knee arthroplasty clinical pathways, defined as group sessions whose contents have been studied with satisfactory results [3].

The principal reference we have with regard to the educational aspects of patients prior to surgery is the Cochrane Library review conducted by McDonald [4]. It assesses 9 studies with a total of 782 patients in which various aspects are rated. Three studies rate the anxiety of the patient during the procedure, finding that preoperative education decreases patient anxiety to a moderate degree according to the State-Trait Anxiety Index assessment. Five studies assess pain between the groups without finding any statistically-significant differences between them and with regard to hospital stay, only one article of a total of five referring to THRs, the one by Crowe, found statistically-significant differences between groups.

Giraudet [5] found in her study for hip arthroplasty only differences with regard to less preoperative anxiety, less post-operative pain and earlier bipedalism in patients who received information regarding the procedure. On the other hand, she did not find differences with regard to hospital stays or overall patient satisfaction. The study uses a series with 48 patients in the study group and 52 in the control group.

Also for hip prosthesis, Siggeirsdottir [6] establishes that hospital stay was significantly shorter in patients with information and patients had an Oxford Hip Score higher than that of the control group two months after surgery. A protocol was established with a physiotherapist or occupational therapy starting one month after surgery. The average stay is 3 days shorter in the study group. Safety has also increased, as the number of complications in the form of luxation of the prosthesis was lower (9 in the study group and 12 in the control group). Yoon [7] includes both knee and hip prostheses in his study, with the most extensive series (168 in the study group and 93 in the control). It concludes that preoperative education significantly reduces hospital stay by approximately one day for both procedures. On this basis, in order to provide the best possible care to our patients, we decided to create, based on prior studies, a work group to design an informational group session called the prosthetics school.

Objectives

The primary objective of our study is to find out the benefits of holding an informational group session prior to prosthetic knee and hip surgery, through modification of the clinical pathway for primary lower limb arthroplasty.

Materials and Methods

Study Design

A prospective randomized single-center controlled trial was done in the hospital de Denia.

Participants

Between January and February 2013, consecutive patients scheduled for total hip and knee arthroplasty were considered for enrollment in the trial. The inclusion criterion for randomization was a first elective total hip or knee arthroplasty for primary osteoarthritis. Exclusion criteria were: secondary osteoarthritis or another disease of the hip or knee, an inability to understand Spanish or English. Patients were

screened after surgical consultation and before their appointment with the anesthetists, approximately 2 to 8 weeks before surgery. Informed consent for participation in the trial was obtained and the trial was approved by the ethics committee of the authors' institution.

Assignment

Patients were assigned randomly to two groups: a multidisciplinary collective information group that received verbal information (intervention group) or a control group that received general information about the procedure in the outpatient clinic by their surgeon with no educational session. Random assignment was done in blocks of 4, using random, computer-generated sequences, in order to maintain the equilibrium between groups by origin (foreign or non-foreign) and surgery type (knee or hip prosthesis).

Intervention

Patients in the intervention group attended an education session 2 to 8 weeks before surgery. The educational sessions were conducted in two groups, one in Spanish and the other in English, due to the special demographic conditions of our healthcare area, which has a large foreign population. The duration of each session was about 45 minutes. Attendance was around 25 to 30 patients, who were allowed to be accompanied by a family member who will usually look after the patient in their home for the first few days after surgery once they are discharged from the hospital. The program of the collective multidisciplinary information session was standardized. The contents of the session were established through interdisciplinary meetings between the hospital's Orthopedic and Trauma Surgery department, the Rehabilitation department, the Physiotherapy Department and Nursing department.

Each session is organized into several parts in which an introduction was made to explain what arthritis is and what a knee or hip prosthesis consists of, what preoperative assessments are for and what the surgery itself consists of. Then, the patient received information about the guidelines and exercises in order to go into surgery in the best physical condition possible, given advice on diet and informed as to what the administrative procedure is when he or she arrives at the hospital. Hospital rules and post-surgical pain management and care plan were the next point discussed, ending up with an explanation of post-op physiotherapy, in-home patient management and the administrative discharge process with check-ups at their healthcare provider and examinations at the hospital. A brief explanation will be given of the alarm symptoms to watch out for after surgery and the procedure to be followed in the event of an emergency. It was used non-medical language in order to improve patient comprehension. The multidisciplinary team consisted in a surgeon, a nurse, a physiotherapist and a rehabilitation physician. The team answered all the questions of the patients and discussed the intervention with them.

The control group (usual procedure) received only the usual verbal information from the surgeon at the outpatient clinic. Verbal information was individual and based on patients' personality, psychology, expectations, and needs (some patients will actively seek more information, whereas others will avoid information)

Measures

The pain was checked on each nursing shift according to the VAS, the degree of satisfaction of the patient on a scale of 0-10, knee mobility

upon discharge in degrees and hospital stay in days were recorded. An assessment was made of the level of satisfaction with nursing personnel in order to rate the perception of the patients of the prosthetics school process, using a functional scale evaluation with a score of 1 to 5. This was done through a subjective survey of each of the components of the onsite nursing department with one central question regarding the rating of the result from the prosthetics school and others regarding experience with nursing staff, patient care by the family and self-care, their anxiety, knowledge of the disease and pain management. As per the study protocol, surveys were filled in without any personal data or information that could identify the patient in any way, except whether the patient belonged to the control or intervention group, and in the latter, whether he or she attended the prosthetics school or not.

Statistical Analysis

Data were reported as mean percentages \pm standard deviation. The main variables of interest (VAS scores, degree of satisfaction, knee range of motion and hospital stay), followed a reasonably normal distribution. Therefore, parametric statistical methods were used to assess relationships between variables: t test (two groups and pair wise test) and chi square tests. The difference between the two groups in change in scores was calculated with 95% confidence intervals. The conventional level 0.05 was used for the first type error. The differences between the groups with time were analyzed statistically using a multiple regression model to adjust for several baseline characteristics and to account for the effect of regression toward the mean.

Analysis of the association between intervention and pain control was done using multilevel mixed-effects linear regression, considering each patient as a separate group, and adjusting the association between decrease in pain and intervention (prosthetics school or control), type of surgery (hip or knee prosthesis), nurse shift of measurement (morning, afternoon or evening) and nationality (foreign or non-foreign). Multiple regression models also were used to compare groups for pain control, day on which the patient stood, and discharge. The analysis was done on an intention to treat basis.

Results

From the 48 eligible patients, two patients were excluded for not meeting the inclusion criteria (second elective knee prosthesis). Twenty-three patients were assigned to the collective multidisciplinary information session Group 1 and 23 patients were assigned to the usual verbal information group (control Group) (Figure 1). All patients completed the trial.

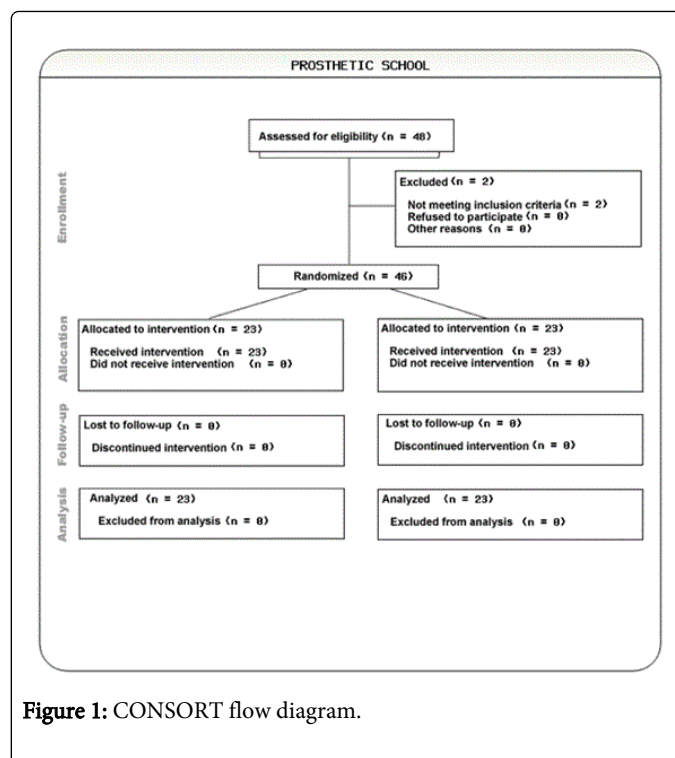


Figure 1: CONSORT flow diagram.

Characteristics of Patients

The study group (n=23) consisted of 10 men and 13 women. 16 of the patients were of Spanish and 7 were foreigners, 12 of whom were receiving knee prostheses and 11 of whom were receiving hip prostheses. In the control group (n=23), there were 11 men and 12 women, 15 of whom were Spanish and 8 of whom were foreigners, 12 of these patients were undergoing a knee arthroplasty and eleven a hip arthroplasty. The average age of the patients was 72.5 \pm 5 years and the predominant side was the right in 59% of cases, with no statistically significant differences between the groups.

Outcome Results

The rating of average pain using a visual analog scale was done using the Student's t test. The distribution curve of the variable "satisfaction" is significantly asymmetrical (p=0.006), so in this case a nonparametric test (Mann-Whitney) was performed, as well as the scoring of the average hospital stay. The decrease in pain, as measured on each shift, with regard to the baseline measurement, was considered the outcome variable. In order to simultaneously take into account the inter-patient and intra-patient variability, following analysis of the variation with regard to baseline pain on each shift, the Kurtosis test was used to make a mixed model from repeated measures, making the comparison between groups using parametric tests, as the results followed a normal distribution.

With regard to the assessment of immediate post-operative pain, the baseline level was higher in the study group, with an average of 6.8 points on the VAS (5.8 in the control group). Following intervention, there was a rapid decrease in the level of pain to levels significantly lower than those of the control group by the second day (2.59 \pm 1.01 in the study group to 4.47 \pm 1.25 in the control group (p=0.000). With regard to mobility upon discharge from the hospital, the study

group had a greater range of motion, with a knee flexion of 85.50+/-3.5° and an extension of -2.23+/-1.01° compared to 79.07+/-5.65° flexion and -5.87+/-2.87° extension in the control group (p=0.000), for the knee prosthetic group.

With regard to degree of satisfaction, greater satisfaction was found in the study group (average of 9.7 with 100% of patients with a score of 9 or 10 points out of 10) than in the control group (average of 9.2). In the study group, 30% of patients scored 9/10 and 70% scored 10/10. In the control group, 5% scored 7/10, 11% scored 8/10, 33% scored 9/10 and 50% scored 10/10. With regard to the results in terms of satisfaction obtained by nursing personnel, we have 4.7 out of 5 in overall satisfactions with the experience of the prosthetics school. In questions regarding the patient's knowledge of the procedure, pain management and perceived tranquility, all respondents said that they very much agreed or totally agreed, rating these parameters as more than 4.5/5 points. Questions regarding whether or not patients and their family members had participated more actively in the patient care process are the ones with a lower rating, with an average of 3.5/5 points; nonetheless, results are satisfactory in both cases (Figure 2).

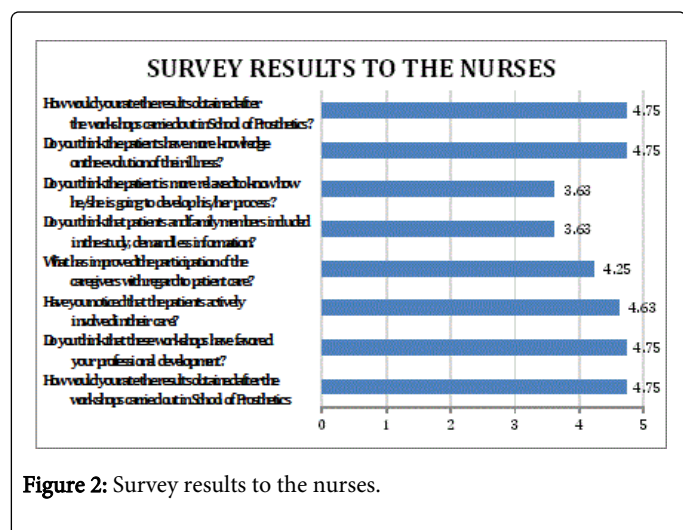


Figure 2: Survey results to the nurses.

Hospital stay was 0.7 days less in the study group, although there were no statistically-significant differences seen between groups measured using the Mann-Whitney test (p=0.6954). In the study group, hospital stay was 4.1+/-0.6 (4-6 range), with 4.2+/-0.7 (4-6 range) for TKR cases and 4.0+/-0.5 (4-6 range) for THRs. In the control group, average stay was 4.8+/-0.9 (4-7 range), with 4.5+/-0.6 (4-6 day range) for TKR cases and 5+/-1 (4-7 range) for THRs. However, comparison of the records system of hospital stays by procedure does indicate a decrease in hospital stays for primary total knee arthroplasty and primary total hip arthroplasty, with a significant decrease in average hospital stay of more than one day since the implementation of the prosthetics school compared to the average from previous years (Figure 3).

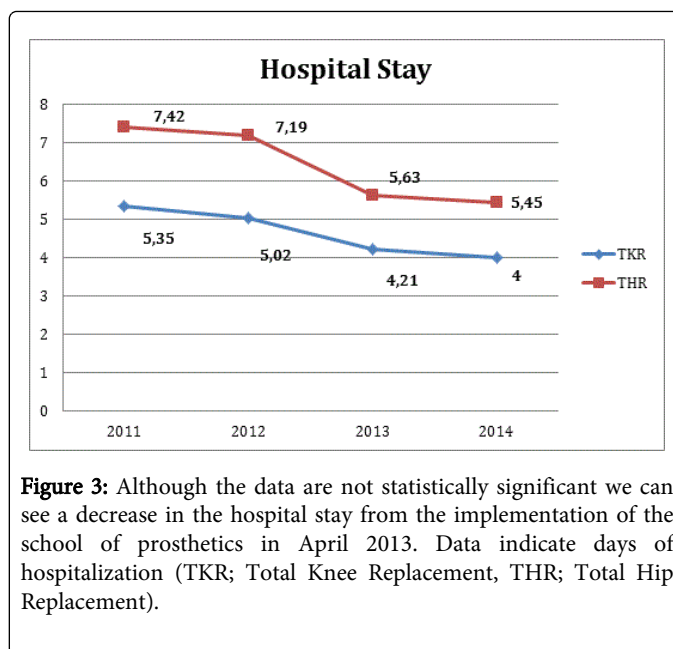


Figure 3: Although the data are not statistically significant we can see a decrease in the hospital stay from the implementation of the school of prosthetics in April 2013. Data indicate days of hospitalization (TKR; Total Knee Replacement, THR; Total Hip Replacement).

Discussion

We have chosen a system of multidisciplinary information sessions because we, along with other authors, believe that it provides the greatest number of advantages by directly provided the information to the patient, allowing for direct interaction with him or her during the session and, through this, solving any questions as they arise. Other methods, such as brochures, video and audio in various formats do not allow for this interaction with the team. The information provided to patients before surgery establishes, on one hand, a mechanism through which patients consent to and participates in the treatment decision, allowing them to understand the factors proposed for their care and, on the other, decreases their preoperative anxiety, thus improving post-surgery recovery [5].

We feel that the ideal duration of the session is less than one hour, conducted between two and eight weeks before surgery, held by a multidisciplinary team during which each member explains the role he or she will play in the process to increase patient safety. We involve the patients in the process, for that reason the discussion is carried out in an interactive manner. All of the above enables us to obtain what we call an "expert patient" in his or her procedure, informed, who will give responses that are as close to reality as possible, who will know beforehand their recovery expectations and will have empathy with the work group, which will improve the relationship between the professionals and the patient and with the procedure in general. In our study, hospital stay was reduced in the study group, although with the sample used the difference was not statistically significant. In their studies, Yoon [7] and Siggeirsdottir [6] show a decrease in stay, although the meta-analysis by McDonald [4] establishes that the difference is not significant in the studies analyzed.

Our results demonstrate lower perception of pain in patients from the study group as of the second day. The same analgesic regimen was administered to both groups. Daltroy [8] concluded in his study that psycho-emotional education prior to surgery focusing on the possibility of unpleasant effects decreases hospital stay, the use of analgesics and general anxiety of the patient. However, Giraudet [5]

demonstrated a reduction in anxiety on a preoperative level but not on a postoperative level; but does objectify less pain in the study group, possibly because patients were prepared to deal with it, less anxiety, as anxiety is directly related to the above and early motion, possible due to greater motivation.

Other beneficial effects of these sessions have been published in other studies. Rehabilitation [3,6] prior to the THR and TKR contributes to decreasing hospital stay and enables the discharge conditions of the patients to be modified. This rehabilitation requires the help of qualified healthcare professionals experienced in educational protocols and the preparing of patients to return home. On the other hand, preoperative patient information has been linked to a decrease in the risk of postoperative joint stiffness requiring mobilization under anesthesia [9].

With regard to the limitations of our study we find its small sample; in order to conclude whether or not there are differences that are really significant we would have to increase the sample size, although this initial approximation has allowed us to draw positive conclusions regarding the implementation of the prosthetics school and the successful modification of our primary lower limb arthroplasty clinical pathway, even though this is a difficult procedure due to its multifactorial nature, often dependent on the social context and the specific circumstances of its implementation; the design of a study without bias from the time of the selection and randomization of the sample (language and type of prosthesis in our case) and even the time of discharge (patients who live alone who increase the average stay or patients with comorbidities). Likewise, the quantification of knee mobility and patient anxiety must be assessed using functional scales that are suited to each parameter and the posterior evolution of the outcome must be rated using a test that assesses the patient's quality of life, such as the SF-36, both in the short and medium terms. In any case, the data obtained allows us to draw conclusions within the surgical procedure itself that have allowed us to improve the quality of patient care over time and with the feedback from the interviews we have been able to adapt our clinical pathways to the needs of patients thanks to the information they provide to us.

Since the prosthesis school started, we have adapted the way of providing pain killers, nowadays we have decided to use a continuous intravenous perfusion during the first 24 hours in order to control the pain better during the postop. During the session we provide a list of things patients will need during their hospital stay, also we explain the process of recovering function after the procedure, such when they will be able to drive. Thanks to the feedback of the prosthesis school we are more concerned about the amount of information patients require, and nowadays we give them access to the online session at our hospital webpage (<http://www.marinasalud.es>) in order to remind them all the highlights of the educational session. In every session we learn new things patients need to know thanks to their questions, and this interaction makes us improve everyday in our job. Lack of validation prior to the study of the mental state of the patient with regard to anxiety and the possibility of depression may have created a bias in the results.

Conclusions

To provide patients with the proper preoperative education, we believe that an in-person group session is better than the education

given by brochures, which are not usually read or not understood, and videos, with which the patient does not interact. The information received by the patient regarding the procedure allows him or her to have more realistic expectations of how the procedure will unfold from the preoperative phase until a full return to his or her activities, both at the hospital and, later, at home.

Functionally and objectively, all of this translates to a decrease in anxiety that will be reflected in a decrease in postoperative pain, a decrease in the demand for rescue analgesics, an increase in cooperation from patients, allowing us to mobilize them sooner, earlier recovery and a decrease in hospital stay under optimum conditions and a general increase in patient satisfaction with regard to their procedure by having more realistic expectations of the outcome.

In prosthetic joint surgery, educating patients increases their satisfaction and reduces their hospital stay. Thanks to this study, the prosthetics school has been routinely established in our hospital with a high degree of satisfaction for the patients, family members and professionals involved.

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