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Original Research Article

A Hospital Based Study Evaluating the Outcomes of Total Hip Arthroplasty Patients

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Abstract

Aim: The aim of the present study was to compare the harries hip score as a patient self-report and a physician-assessed instrument in evaluating the outcomes of total hip arthroplasty patients.

Methods: This study is based on a cohort of 50 patients with 50 primary THAs who were a minimum of 1-year post surgery in the Department of Orthopedics, Government medical college West Champaran, Bettiah, Bihar, India.

Results: There were 16 men and 34 women, with a mean age of 69 years. 21 patients had done post-graduated study and 60% had unilateral hip involvement. The mean HHS by self-report questionnaire was 76.0 ± 19.0; the surgeon-assessed HHS was 78.7 ±18.7. The WOMAC scores at clinical follow-up were pain, 2.3 ± 3.1; stiffness, 1.8 ± 1.7; and physical function, 15.3 ± 12.3. The SF36 scores at clinical follow-up were general health, 74.9 ±17.6; physical function, 47.8 ± 28.1; role physical, 55.5 ± 41.4; and bodily pain, 64.6 ± 26.4. The Pearson correlation for the 3 WOMAC scales ranged from 0.90 to 0.96 (P<.0001); for the 8 SF36 scales, the range was 0.78 to 0.97 (P<.0001). The highest Pearson correlation coefficient was noted for the self-report HHS and physician-assessed HHS at 0.99 (P<.0001). The n statistics evaluate the level of agreement between the 2 methods of administration that exists beyond chance. Values >0.75 indicate excellent agreement and are considered sufficient for most instruments in which group level comparisons are being considered. The values for the n statistic for each item of the HHS ranged between 0.79 and 1.00 (P<.0001).

Conclusion: The performance of a patient self-report HHS is comparable to that of a physician-administered HHS. Because a self-report format offers several advantages over a physician-administered format, greater consideration should be given to its use in evaluating the outcomes of THA.

Keywords: Harris hip score, hip arthroplasty, self report, outcomes, arthritis

Introduction

Many outcome measures have been developed for the assessment of hip pathologies, such as the Oxford Hip Score, Nonarthritic Hip Score, Hip and Groin Outcome Score, International Hip Outcome Tool, Hip Outcome Score, Hip Dysfunction and Osteoarthritis Score, and Merle d'Aubigné and Postel score. [1-6] The Harris Hip Score (HHS) is one of the most widely used health related quality of life measures for the assessment of hip pathology. [7]

The HHS was developed for the assessment of the results of hip surgery and evaluation of various hip disabilities in an adult population.[8] The HHS is administered by a physician or physiotherapist and presents a scale with the maximum of 100 points, including evaluation of pain, function, deformity and motion. [8] The pain domain measures pain severity and its effect on activities and need for pain medication. The function domain is divided into daily activities (stair use, using public transportation, sitting, and managing shoes and socks) and gait (limp, support needed, and walking distance). The deformity domains observe hip flexion, adduction, internal rotation, and extremity length discrepancy while the range of motion (ROM) domain asses hip ROM. The range of motion item consists of 6 motions that are graded based on the arc of motion possible. Each range of motion gradation is assigned an index factor and a maximum possible value, which are used to calculate arc of motion points. [8]

These points are added and multiplied by 0.05 to receive the total points for range of motion. The total score is calculated by summing the scores for the 4

domains. [8,9] The score is covering pain (1 item, 0–44 points), function (7 items, 0–47 points), absence of deformity (1 item, 4 points), and range of motion (2 items, 5 points). A total score below 70 points is considered a poor result, 70 to 80 reasonable, 80 to 90 good and 90 to 100 excellent. [10]

The aim of the present study was to compare the harris hip score as a patient self-report and a physician-assessed instrument in evaluating the outcomes of total hip arthroplasty patients.

Materials and Methods

This study is based on a cohort of 50 patients with 50 primary THAs who were a minimum of 1 year post surgery in the Department of Orthopedics, Government medical college West Champaran, Bettiah, Bihar, India for one year. These were consecutive patients re- turning for

All patients were surveyed by mailed questionnaire routine annual follow-up who had under gone THA by a single senior surgeon. No cases were excluded. before the clinical follow-up appointment. The mean time between completion of questionnaires and clinical follow-up was 30 days. During this relatively short interval, the patient's health state with respect to hip function was unlikely to have changed because all patients were at least 1 year post surgery. The questionnaires included the SF36, WOMAC, and a self-report HHS. The self- report HHS consisted of the HHS questions on hip pain, limp, use of walking supports, distance walked, difficulty with sitting in a chair, difficulty putting on shoes and socks, and difficulty with climbing stairs. The possible score range was 0 to 90. For ease of presentation, this score range was rescaled to 0 to 100. The question on use of public transport was excluded because it was not applicable in the same manner as it had been when the HHS was developed. Hip range of motion and deformity could not be evaluated in a patient self- report format and were excluded. An independent orthopedic surgeon who was unaware of the response on the mailed questionnaire evaluated patients at the clinical follow-up visit. This evaluation included a HHS, physical examination, and routine radiographic examination. In addition, patients completed a WOMAC and SF36.

Statistical Analysis

Test-retest reliability is a measure of an instrument's stability in response patterns during a short period in which the individual's actual health status has not changed and their scores should not change. The WOMAC and SF36 have proven test- retest reliability. We compared the mean scale scores on these instruments at the time of mailed survey and clinical follow-up. These scores were compared with self-report and physician-based response on the HHS to assess the stability of re- sponse patterns. Statistical analysis was performed using PC-SAS version 6.12 (SAS Institute, Cary, NC) and BMDP procedure 4F (BMDP Statistical Software Inc, Los Angeles, CA). The crucial level for statistical significance was P<.05.

Results

Table 1: Demographic data

Demographic	
Age (y)	69 ± 12
Gender	
Men	16 (32%)
Women	34 (68%)
Education	
Completed high school	16 (32%)
Completed college	13 (26%)
Postgraduate schooling	21 (42%)
Side	
Left	22 (44%)
Right	28 (56%)
Total hip arthroplasty	
Unilateral	30 (60%)
Bilateral	20 (40%)
Primary diagnosis (no. hips)	
Congenital hip dysplasia	24 (48%)
Osteoarthritis	8 (16%)
Avascular necrosis	3 (6%)
Rheumatoid arthritis	3 (6%)
Other	12 (24%)

There were 16 men and 34 women, with a mean age of 69 years. 21 patients had done post-graduated study and 60% had unilateral hip involvement.

Table 2: Comparison of WOMAC and SF-36 Self- Report Scores With Self-Report and Surgeon-Administered Harris Hip Score

	Scores From Mailed Survey	Scores at Time of Clinical Assessment	Pearson Correlation Coefficient
HHS	76.0 ± 19.0	78.7 ± 18.7	0.99
WOMAC			
Pain	2.4 ± 3.1	2.3 ± 3.1	0.90
Stiffness	1.9 ± 1.7	1.8 ± 1.7	0.96
Physical function	15.6 ± 11.6	15.3 ± 12.3	0.92
SF-36			
General health	69.5 ± 23.1	74.9 ± 17.6	0.78
Physical function	45.1 ± 29.0	47.8 ± 28.1	0.96
Role physical	53.5 ± 42.3	55.5 ± 41.4	0.97
Bodily pain	63.4 ± 28.2	64.6 ± 26.4	0.95
Vitality	57.7 ± 19.1	60.6 ± 20.7	0.93
Social function	47.8 ± 12.8	51.0 ± 10.1	0.71
Role emotional	75.3 ± 41.4	77.3 ± 37.2	0.97
Mental health	77.4 ± 17.6	80.0 ± 18.3	0.91

The mean HHS by self-report questionnaire was 76.0 ± 19.0; the surgeon-assessed HHS was 78.7 ±18.7. The WOMAC scores at clinical follow-up were pain, 2.3 ± 3.1; stiffness, 1.8 ± 1.7; and physical function, 15.3 ± 12.3. The SF36 scores at clinical follow-up were general health, 74.9 ±17.6; physical function, 47.8 ± 28.1; role physical, 55.5 ± 41.4; and bodily pain, 64.6 ± 26.4. The Pearson correlation for the 3 WOMAC scales ranged from 0.90 to 0.96 (P<.0001); for the 8 SF36 scales, the range was 0.78 to 0.97 (P<.0001). The highest Pearson correlation coefficient was noted for the self-report HHS and physician-assessed HHS at 0.99 (P<.0001).

Table 3: Individual Harris Hip Score Item Response Comparison Between Self-Report and Surgeon Assessment

HHS Items	Score From Mailed Survey	Score From Surgeon Assessment	Self-Report % Completion	Concordance Between Self-Report and Surgeon Assessment	n Statistic
Pain	37.1 ± 9.5	37.5 ± 9.4	94	96	0.94
Distance walked	6.4 ± 4.1	7.4 ± 4.1	92	85	0.79
Support	7.4 ± 4.2	8.2 ± 4.0	76	97	0.96
Limp	7.4 ± 3.7	7.6 ± 3.6	90	100	1.00
Stair climbing	2.4 ± 1.1	2.3 ± 1.1	86	98	0.96
Sitting	4.1 ± 1.1	4.1 ± 1.1	100	100	1.00
Shoes and socks	3.0 ± 1.1	3.0 ± 1.2	92	96	0.92

The n statistics evaluate the level of agreement between the 2 methods of administration that exists beyond chance. Values >0.75 indicate excellent agreement and are considered sufficient for most instruments in which group level comparisons are being considered. The values for the n statistic for each item of the HHS ranged between 0.79 and 1.00 (P<.0001).

Discussion

Since Codman [11] first drew attention to the importance of evaluating outcomes, orthopedists have worked to quantify clinical outcomes. This interest has been spurred on by changes in the health care industry that have led to increased emphasis on evaluating quality of care and containing costs. Outcome assessment allows purchasers and providers to evaluate the quality of services delivered. The use of standardized outcome instruments allows comparisons between different patient cohorts to evaluate the effectiveness of different procedures or prostheses. Many authors have stressed the importance of outcome evaluation in total hip arthroplasty (THA). [12-16]

There were 16 men and 34 women, with a mean age of 69 years. 21 patients had done post-graduated study and 60% had unilateral hip involvement. The mean HHS by self-report questionnaire was 76.0 ± 19.0; the surgeon-assessed HHS was 78.7 ±18.7. The WOMAC scores at clinical follow-up were pain, 2.3 ± 3.1; stiffness, 1.8 ± 1.7; and physical function, 15.3 ± 12.3. The SF36 scores at clinical follow-up were general health, 74.9 ±17.6; physical function, 47.8 ± 28.1; role physical, 55.5 ± 41.4; and bodily pain, 64.6 ± 26.4. The Pearson correlation for

the 3 WOMAC scales ranged from 0.90 to 0.96 (P<.0001); for the 8 SF36 scales, the range was 0.78 to 0.97 (P<.0001). The HHS is the most widely used hip scoring system in the literature. Although empirically de- rived, the HHS covers similar domains (hip pain and function) as contemporary patient-based quality- of-life measures such as the WOMAC. The HHS is one of the few traditional hip scoring systems that has had its performance characteristics evaluated. [17-19] Use of the HHS in evaluating existing THA cohorts is crucial because the preoperative and short-term outcomes usually are based on the HHS. Comparison of long-term outcomes with earlier reports necessitates the continued use of the HHS in addition to more contemporary instruments. Contemporary outcome instruments are patient based and use a self-report methodology. The use of the HHS as a self-report instrument offers several advantages, including easier administration by mailed survey, evaluation format consistent with contemporary instruments, less expensive than for- mal physician assessment, and less burdensome to patients than formal clinical evaluation. [20]

The highest Pearson correlation coefficient was noted for the self-report HHS and physician-assessed HHS at 0.99 (P<.0001). The n statistics evaluate the level of agreement between the 2 methods of administration that exists beyond chance. Values >0.75 indicate excellent agreement and are considered sufficient for most instruments in which group level comparisons are being considered. The values for the n statistic for each item of the HHS ranged between 0.79 and 1.00 (P<.0001). We found excellent agreement between patient self-report and physician assessment of pain and function based on items in the HHS. In contrast, Lieberman et al [32] found significant differences between patient self-report and physician evaluation of outcomes after THA. Lieberman et al [32] used visual analog scales for evaluating outcomes. We believe this methodology introduces significant problems of interpretation by respondents because there are no interval scale markers to help define what a given response means for patients and physicians. In our study, we used the HHS, which contains multiple choice questions with fixed response categories. This format minimizes problems of subjective interpretation of the response scales by respondents in relation to the severity of the problem being evaluated.

Conclusion

The performance of a patient self-report HHS is comparable to that of a physician-administered HHS. Because a self-report format offers several advantages over a physician-administered format, greater consideration should be given to its use in evaluating the outcomes of THA.

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