

THE PHYSICAL AND PSYCHOSOCIAL EFFECT OF MODERATE OSTEOARTHRISIS OF THE KNEE

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ABSTRACT. To illustrate both physical and psychosocial effects of moderate gonarthrosis, clinical examination of patients has been supplemented with a questionnaire SIP (Sickness Impact Profile), to describe the functional health status. Sixty patients, 35 women and 25 men, mean age 63 years, with moderate medial osteoarthritis of the knee and no symptoms from other joints, were included in the study. The mean BOA score and the self-selected walking speed were decreased in these patients compared to normal individuals. All patients graded pain during walking. The SIP revealed both physical and psychosocial changes in these patients with moderate gonarthrosis. Patients considered that their knee osteoarthritis had great influence physically on ambulation, during recreation and pastimes, during sleep and rest, and psychosocially on emotional behaviour. Significant correlations ($p < 0.01$) were found between pain during walking and the psychosocial questions in the SIP, between the BOA score and questions in the SIP concerning the physical performance, and between self-selected walking speed and the physical questions. It is concluded that the SIP appears to be a measure with sufficient sensitivity to detect physical and psychosocial changes in patients with moderate osteoarthritis of the knee. In clinical practice determination of self-selected walking speed and pain during walking will appropriately reflect general function.

Key words: correlation, health status, knee, osteoarthritis, pain, physical, psychosocial, walking speed.

In patients with osteoarthritis interest has mainly been focused on pain and secondarily on clinical and radiographical findings. However, patients experience pain very differently and consequently the pain will have a very individual influence on patient's functional capability and functional health status. Different methods for evaluating function and capacity have been presented (14, 15, 16, 17) and the self-selected walking speed has, besides pain-grading, been considered as a useful and reliable parameter for

functional evaluation of patients with gonarthrosis (16).

An increasing awareness of the multidimensional impact of disease has, however, led to the development of various quality-of-life measures for assessing the general condition of patients. Health status instruments have been constructed for assessment of the impact of sickness on physical and psychosocial function (6). The Sickness Impact Profile (SIP) is a well-known measure of functional health status and has been validated as a measure of differences in function between patients (7). This health status score has been used to study patients with rheumatoid arthritis (2, 9, 19), renal disease (12), low back pain (10), chronic pain (5), and after hip replacements (6), but to our knowledge not patients with osteoarthritis of the knee.

The aim of this study was to describe patients with moderate osteoarthritis of the knee, clinically and functionally, and to define physical and psychosocial effects of the disease.

SUBJECTS AND METHODS

Sixty patients, 35 women and 25 men, mean age 63 years (range 55-70 years) with moderate (grade I-III according to Ahlbäck's classification) (1) medial osteoarthritis of the knee and no symptoms from other joints, were included in the study. All patients were free from cardiorespiratory diseases. Mean duration of symptoms was 11 ± 8 years (mean \pm SD) and mean weight was 83 ± 13 kg. All patients were accepted for knee surgery (tibial osteotomy or unicompartmental replacement). No patient used walking aids indoors. Two patients used one stick for walks outdoors.

Clinical characteristics

All patients were clinically and radiographically examined. The British Orthopaedic Association (BOA) knee function chart was used to rate clinical findings (3). The questions in the BOA chart on gait and the patients' own opinion were excluded giving a maximal score of 39 points. The excluded variables were more thoroughly assessed with other tests in this study.

Table I. Mean scores of sickness impact profile (SIP) categories in patients with moderate osteoarthritis of the knee

Dimension, category	Mean score	SD	Range
Total SIP	7.4	5.6	1-29
Physical SIP (F)	10.8	7.2	1-34
Ambulation (A)	23.3	10.6	0-40
Mobility (M)	4.2	10.6	0-50
Body care and movement (BCM)	7.6	7.5	0-33
Psychosocial SIP (PS)	3.6	5.5	0-29
Social interaction (SI)	2.3	4.8	0-22
Alertness behavior (AB)	2.3	8.9	0-56
Emotional behavior (EB)	10.6	13.1	0-59
Communication (C)	0.7	3.1	0-20
Independent categories			
Sleep and rest (SR)	17.3	15.6	0-62
Eating (E)	0.3	1.7	0-12
Home management (HM)	8.0	13.7	0-53
Recreation and pastimes (RP)	20.0	15.3	0-66
Work (W)	0	-	-

Walking test

The patients were asked to walk along an indoor corridor of 75 m at their self-selected, most comfortable walking speed. Walking speed was determined by a speedometer (in m/min) (14). The patients were asked to grade their pain and exertion during walking at the end of every walking test (300 m) using a ten-graded scale (8).

Health status measures

To verify the impact of moderate osteoarthritis of the knee on health status, a behaviourally based measure of health status, the Sickness Impact Profile (SIP), was used (6, 7). The SIP is a standardized instrument consisting of 136 statements that measure sickness-related dysfunction in many dimensions (11, 13). The 136 statements are scaled and weighted and grouped into 12 categories (Table I), each of which describes an area of behavioural dysfunction. Weighted scores from body care and movement (BCM), mobility (M), and ambulation (A) categories are combined to a physical dimension (F). Weighted scores from emotional behaviour (EB), social interaction (SI), alertness behaviour (AB), and communication categories (C) are summed to a psychosocial dimension (PS). The other categories are sleep and rest (SR), eating (E), home management (HM), recreation and pastimes (RP), and work (W). Weighted scores from all 12 categories are summed to a total SIP (T). The SIP scores range from 0 to 100. The more the patients perceive themselves as being functionally limited the higher the scores (6).

SIP has been proved valid, reliable, sensitive to clinical changes, and capable of comprehensively assessing a wide range of dysfunction (7, 9). It is simple, relatively short, and easy to understand, administer, and record. The Swedish

version of the SIP was used (19). The SIP form was filled in by the patient at the same occasion as the walking test was performed. As most of the patients were sick-listed or retired from work or were expected to become retired all statements on work were put as zero.

Statistical methods

Mean \pm SD and range are used to present data. The results of SIP were calculated as a percentage reduction of normal function. The Mann-Whitney's U test was used for analysis of differences between independent groups. Different methods were applied according to the data scale level for analysis of correlation (Pearson's correlation, Spearman's rank correlation).

Level of significance is given in the text and for analysis of correlations the level of significance was chosen to $p < 0.01$.

RESULTS

Clinical measures

The mean BOA score was 30 ± 2.0 points (range 25-34 points). Fifteen patients worked full time, 27 patients were retired, and 18 patients were sick-listed because of their gonarthrosis.

Walking test

Mean self-selected, comfortable walking speed was 63 ± 9.5 m/min, and reduced compared to healthy subjects 80 m/min (18). Mean values for pain and perceived exertion during walking were 3.5 ± 1.5 (range 0-10) and 2.4 ± 2 (range 0-7) respectively.

Health status measures

The total SIP score for the patients averaged 7.4 ± 5.6 (range 1-29) (Table I), which means that there was a 7.4% reduction of normal health status in these patients.

The physical SIP (F) was reduced with 10.8% and the psychosocial SIP (PS) with 3.6%. Patients considered that their knee osteoarthritis greatly influenced their ambulation (A) 23% reduction, recreation and pastimes (RP) 20%, sleep and rest (SR) 17%, and emotional behaviour (EB) 11% reduction.

The women rated a higher reduction of home management (HM) (mean 11.5 ± 16 , range 0-53) than men (mean 3.4 ± 8.2 , range 0-36), $p < 0.05$. All other categories did not show any difference between sex, age or duration of symptoms.

Correlations

The BOA score was significantly correlated to the physical SIP (F), especially the category BCM ($p = 0.0001$), and to pain ($p = 0.0035$), and perceived exertion ($p = 0.0045$) during walking.

Self-selected walking speed was correlated to total SIP ($p=0.0003$). The only dimension correlated to self-selected walking speed was the physical SIP (F) ($p=0.0001$), and especially categories A ($p=0.0001$), and BCM ($p=0.0025$).

Pain during walking was correlated, besides to the BOA score, to the psychosocial SIP (PS) ($p=0.001$), especially categories EB ($p=0.0018$) and AB ($p=0.007$). Perceived exertion was only correlated to the BOA score ($p=0.0045$).

No relationship was found between SIP and age, weight, or duration of symptoms.

DISCUSSION

The results of this study show that there are both physical and psychosocial effects from moderate osteoarthritis of the knee. The overall reduction in general health assessed with the total SIP score was 7% which is on a level with that previously reported for patients with rheumatoid arthritis (19). In accordance with findings in rheumatoid patients, ambulation was greatly influenced in our patients with moderate osteoarthritis of the knee, but emotional behavior was also greatly affected. Interestingly, there was no relationship between reduction in the categories of SIP and the duration of symptoms. This lack of relationship can be explained by the fact that, although a long duration of knee symptoms, the problems had probably not been sufficiently pronounced to give an impact on the general health.

Reduction of emotional behavior was found to be significantly correlated to degree of pain. From a clinical point of view, pain is considered as an important factor and pain relief is a main object of treatment in patients with osteoarthritis. Pain rate is often included in clinical scores, but given different weights in different scores (4). In this study, pain was assessed both with questions included in the BOA score and with a category scale during walking. Although only 4 out of 39 points in the BOA score concern pain directly, the pain seems to infiltrate the clinical findings in such a way that there was a high correlation between the BOA score and graded pain during walking. Interestingly, in the SIP, graded pain was neither associated with recreation and pastimes nor to ambulation and mobility, but to the categories of the psychosocial SIP. Pain is, however, perceived very individually and since it often varies in time and is difficult to assess, we consider functional tests which pay regard to the influence of pain as most appropriate in clinical assessments.

In previous studies we have found the self-selected walking speed to be suitable for reflecting the degree of impairment and to be useful in assessing treatment effects (15, 16). Results of this study showed that the self-selected walking speed was highly correlated to categories of the physical SIP. Thus, we conclude that in clinical practice determination of self-selected walking speed and pain during walking will reflect general function appropriately.

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