The Algofunctional Indices for Hip and Knee Osteoarthritis

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ABSTRACT. The severity or algofunctional indices for hip and knee osteoarthritis (OA) have been used in Europe for about 10 years. They were validated, then published between 1982 and 1987[1,2]. They are useful mainly as outcome measures in OA trials, and also for appraising the severity of patient function: a score above 11–12 points after appropriate treatment indicates surgery. Most patients recruited in OA trials have a score of 9–11 (SD 2.3 to 3.8), decreasing about 30 to 40% with the active drug. The effect size reaches 1.3 to 1.8. The indices have 2 advantages: they are structured separately for hip and for knee OA and the same instrument serves as a measure of severity (disability scale) and as an outcome measurement tool in trials. (*J Rheumatol 1997*;**24:779–81**)

Key Indexing Terms:
HIP KNEE OSTEOARTHRITIS
OUTCOME AND PROCESS ASSESSMENT FUNCTIONAL INDEX

We determined algofunctional indices for osteoarthritis (OA) of the hip and knee in 1979–85[1,2], and, after completing validation of the knee index, in 1987 we reported on the labeling of "severity indices"[3]. Aimed at assessing patients' functional and pain status these indices make it possible to follow patients during a drug trial or over years and to determine the time limit to surgery on the basis of a quantitative instrument rather than impression.

Algofunctional indices of OA are presented in Table 1. They comprise 8 points for pain, 8 for the maximum distance walked, and 8 for activities of daily living. The theoretical maximum of 24 points is never achieved. Degree of disability corresponding to different scores of the indices are as follows:

Score in Points	Handicap
14	Extremely severe
11–13	Very severe
8–10	Severe
5–7	Moderate
1–4	Minor

According to our experience in cooperation with orthopedic surgeons, scores indicating surgery is necessary are 10–12 points and higher (when the patient is under suitable medical treatment). However, the right part of the above table should be shown to the patient, asking his/her self-assessment of his/her handicap. If he/she rates a handicap substantially higher than the corresponding algofunctional indices OA score, an explanation is sought. The explanation is often pertinent, e.g., a patient with special needs regarding his/her job, family, travel, hobby, etc.

The previous comments apply to daily practice and surgical decision making. However, in the field of scientific methodology, the algofunctional indices are mainly used for trials of new drugs to be tested, either by oral or intraarticular route. Validation of the algofunctional indices showed that a mean of 20 patient interviews, controlled by a senior investigator, are necessary for training new investigators to obtain consistent results. The questionnaire, which is memorized, is not time consuming: 3 to 4 minutes were enough, and intraobserver reproducibility was found satisfactory, with the difference between 0.2 and 0.55 points, resulting in a non-significant Student's t test. Initial validation also involved quantitative study of the ability of several tests to distinguish the period of classical nonsteroidal antiinflammatory drugs (NSAID) from that of placebo in a crossover trial. In hip OA, the algofunctional index was first, alongside the investigator's overall opinion ($p < 0.001$), followed by pain visual analog scale (VAS) and patient assessment ($p < 0.01$), and before walking time ($p < 0.05$). In knee OA, the algofunctional index was second ($p = 0.01$), after pain, VAS, and investigator's overall opinion[3].

Further, the following information may now be drawn from numerous trials involving OA within the last 8 years. Patients recruited in trials for testing either NSAID or a symptomatic slow acting drug in OA (SYSADOA) often have advanced OA, usually with an algofunctional score of 9–11 points at baseline (standard deviation 2.3 to 3.8). After one or 2 weeks taking NSAID, and after a longer period with SYSADOA (6–8 weeks), algofunctional scores usually decrease from 2.5 to 4 points (about 25–40%). In trials of active drugs, the effect size of algofunctional indices ranges from 1.07 (tenoxicam)[4] to 1.86 (nimesulide)[5]. Most often, the effect size of VAS for pain is higher. Studies including data allowing possible comparison between algofunctional

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Table 1. Algofunctional index for OA.

Hip OA		Knee OA	
Pain or discomfort		**Pain or discomfort**	
During nocturnal bedrest		During nocturnal bedrest	
None or insignificant	0	None or insignificant	0
Only on movement or in certain positions	1	Only on movement or in certain positions	1
With no movement	2	With no movement	2
Morning stiffness or regressive pain after rising		Morning stiffness or regressive pain after rising	
1 min or less	0	1 min or less	0
More than 1 but less than 15 min	1	More than 1 but less than 15 min	1
15 min or more	2	15 min or more	2
After standing for 30 min	0–1	After standing for 30 min	0–1
While ambulating		While ambulating	
None	0	None	0
Only after ambulating some distance	1	Only after ambulating some distance	1
Early after initial ambulation and increasingly with continued ambulation	2	Early after initial ambulation and increasingly with continued ambulation	2
After initial ambulation, not increasingly	1	After initial ambulation, not increasingly	1
With prolonged sitting (2 h)	0–1	While getting up from sitting without the help of arms	0–1
Maximum distance walked (may walk with pain)		**Maximum distance walked (may walk with pain)**	
Unlimited	0	Unlimited	0
More than 1 km, but limited	1	More than 1 km, but limited	1
About 1 km (0.6 mi) (in about 15 min)	2	About 1 km (0.6 mi), (in about 15 min)	2
From 500 to 900 m (1,640–2,952 ft or 0.31–0.56 mi) (in about 8–15 min)	3	From 500 to 900 m (1,640–2,952 feet or 0.31–0.56 mi) (in about 8–15 min)	3
From 300 to 500 m (984–1,640 ft)	4	From 300 to 500 m (984–1,640 ft)	4
From 100 to 300 (328–984 ft)	5	From 100 to 300 m (328–984 ft)	5
Less than 100 m (328 ft)	6	Less than 100 m (328 feet)	6
With one walking stick or crutch	1	With one walking stick or crutch	1
With 2 walking sticks or crutches	2	With 2 walking sticks or crutches	2
Activities of daily living*		**Activities of daily living***	
Put on socks by bending forward	0–2	Able to climb up a standard flight of stairs?	0–2
Pick up an object from the floor	0–2	Able to climb down a standard flight of stairs?	0–2
Climb up and down a standard flight of stairs	0–2	Able to squat or bend on the knees?	0–2
Can get into and out of a car	0–2	Able to walk on uneven ground?	0–2

* Without difficulty: 0; with some difficulty: 0.5; moderate: 1; important difficulty: 1.5; unable: 2.

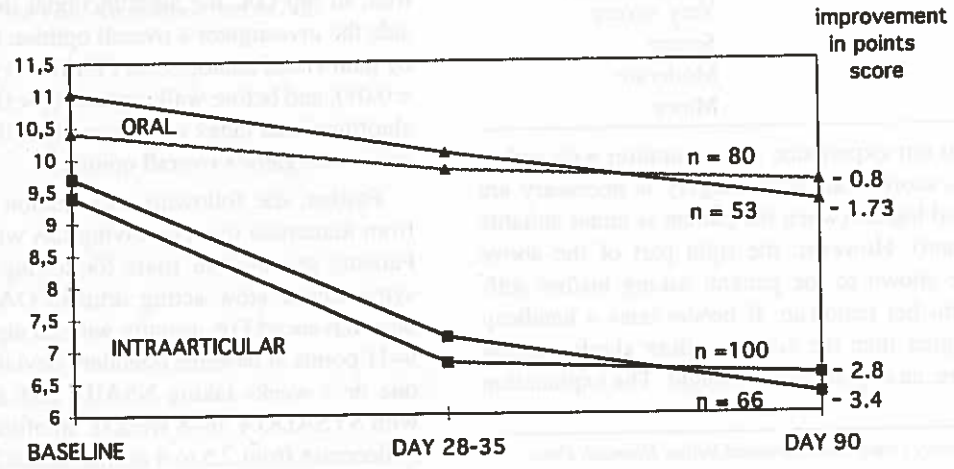

Figure 1. The algofunctional index for knee OA: examples in placebo groups in 2 oral and 2 intraarticular trials over 3 months. The intergroup differences placebo/active drug (not included here) were largely significant in the 2 oral (NSAID) trials, and not significant, or borderline, in the intraarticular (hyaluronan) trials.

indices and Western Ontario and McMaster University Arthritis Index (WOMAC) are rare. However, in a trial on knee OA[6], the effect size of WOMAC is less than that of algofunctional indices: 1.0 and 2, respectively, at Week 8, and 0.7 versus 1.33 at Week 12.

The validity of the algofunctional indices of OA has been repeatedly confirmed. In general, index results are close to, but operate independently from, other outcome measures such as VAS for pain or global assessment. In the placebo groups of trials, algofunctional scores responded as expected: for example, in 2 oral SYSADOA trials over 3 months, placebo scores decreased only 0.8 to 1.7 points, whereas in the case of sham intraarticular injections (quasi-placebo of hyaluronan), considered stronger in placebo effect, scores decreased 2.8 to 3.4 (Figure 1)[7]. Moreover, Bellamy, *et al* showed that the algofunctional and WOMAC indices correlated well[8].

It is possible to use a self-administered version of the algofunctional questionnaire. In fact, the correlation between this mode and interview by investigator runs from 0.70 (baseline) to 0.82 (5th visit learning effects).

In summary, the algofunctional indices of OA structured separately for hip OA and for knee OA are appropriate in studies in each of these very common forms of OA (one disease, one trial). Their responsiveness and effect size are satisfactory. They provide an outcome measure different from that of VAS pain scale, but not in conflict with it. Moreover, the indices help to objectively determine the right time for surgery.

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