A LOCALLY ADAPTED FUNCTIONAL OUTCOME MEASUREMENT SCORE FOR TOTAL HIP REPLACEMENT IN WEST AFRICA: INTRODUCTION OF THE OUAGA SCORE

L. Dossche, MD, Department of Orthopaedic Surgery & Traumatology and Department of Sports Medicine, Antwerp University Hospital, Antwerp, Belgium, **J. Noyez,** MD, Department of Orthopaedic Surgery & Traumatology, Delta Hospital, Roeselare, Belgium, **B. Quaghebeur,** MD, Department of Anaesthesiology, Delta Hospital, Roeselare, Belgium and **W. Ouedraogo,** MD, **E. Kalmogho,** MD, Department of Surgery, Paul VI Hospital, Ouagadougou, Burkina Faso

Correspondence to: Dr. L. Dossche, Department of Orthopaedic Surgery & Traumatology and Department of Sports Medicine, Antwerp University Hospital, Antwerp, Belgium. Email: lieven.dossche@ping.be

ABSTRACT

Background: Functional outcome scores are often used to measure results of Total Hip Replacement (THR). Most current scoring systems were designed for use in Europe or North America and seem not optimally suited for a general West African setting. We introduce a cross-cultural adaptation of the Lequesne index as a new score.
Method: A new functional hip score, adapted to the West African setting and based on the Lequesne Index was introduced. To evaluate this score, the score questionnaire was completed by a group of patients in the Paul VI Hospital in Ouagadougou, Burkina Faso, who were possible candidates for hip replacement. Patients with hip fractures were excluded. Double scores acquired with a minimal interval of four weeks were analysed and test-retest reliability was assessed using intra-class correlation coefficient.
Results: Mean patient age was 43,3 years. All patients were able to answer all questions. Double scores were available in 21 patients. Intra-class correlation coefficient was 0.896 indicating very good correlation.
Conclusion: The current study has shown that the cross-cultural adaptation of the Lequesne Index, used as Ouaga Score. It can be obtained easily and is reliable in a general West African patient population. We recommend the use of the Ouaga Score for functional evaluation and follow-up of THR in West Africa.

Key words: THR, Hip, Africa, Functional score, Hip replacement, Arthroscopy

INTRODUCTION

Results and success of total hip arthroplasty are often measured using a functional outcome scoring system. Most current scores were developed in Europe and North America (1-3). During the evaluation of a Total Hip Replacement (THR) project in Ouagadougou, Burkina Faso (4) it was felt that these scores were not well suited for use in West Africa: for many patients it is difficult to travel to the hospital for control visits due to financial and geographic barriers. Some questions found in most questionnaires seem not well adapted to living habits in the general West African population (e.g. difficulties putting on socks). Overall, we found that current hip scores were not appropriate for use in the evaluation of THR in a general West African population. An adequate scoring system should comprise of a clear and relevant questionnaire that can be completed by telephone. Adaptations to the Lequesne Algofunctional Index (5) were made, taking into account local living habits. Scores can range from 0 to 24 with 0 indicating no limitations and increasing values indicating higher levels of functional impairment.

MATERIALS AND METHODS

The introduction and evaluation of the new score was carried out in the Paul VI Hospital in Ouagadougou. The questionnaire was developed by Belgian orthopaedic surgeons together with Burkinabese surgeons, the latter being well acquainted with living conditions and habits of the general population in Burkina Faso. We assumed that most patients would be able to answer the questions without significant difficulty. The adapted index was used as 'Ouaga score'. The score was developed and used in French (Table 1). An English translation was prepared by the authors (Table 2). As a cross check the English translation was re-translated into French by two native speakers of both French and English. The new French text was compared to the original French text.

Table 1
Ouaga Score – French version

Points acquired for each question should be added up to calculate score	
Douleur ou gène la nuit	
Non	0
Seulement en remuant ou selon la posture	1
Même immobile	2
Douleur ou gène lors du dérouillage matinal	
Moins d'une minute	0
De 1 à 15 minutes	1
Plus de 15 minutes	2
Douleur ou gène lors de la station debout	
Non	0
Oui	1
Douleur ou gène lorsque vous marchez	
Non	0
Seulement après une certaine distance	1
Très rapidement, de façon croissante	2
Votre hanche vous gêne-t-elle si vous restez assis longtemps?	
Non	0
Oui	1
Périmètre de marche maximale	
Aucune limitation	0
Limité mais supérieur à 1 km	1
Environ 1km soit 15 minutes	2
500 à 900m	3
300 à 500m	4
100 à 300m	5
Moins de 100m	6
Une canne ou une béquille nécessaire	+1
2 cannes ou béquilles nécessaires	+2
Difficultés dans la vie quotidienne	
Rammasser un objet à terre	
Aucune dificulté	0
Possible avec une difficulté	1
Possible mais difficilement	2
Possible mais très difficilement	3
Impossible	4
*sortir d'une voiture ou d'un fauteuil profon*d	
Aucune dificulté	0
Possible avec une difficulté	1
Possible mais difficilement	2
Possible mais très difficilement	3
Impossible	4
Total	
Indique le calcul total de points	

Table 2
Ouaga Score – English version

Points acquired for each question should be added up to calculate score	
Pain or discomfort at night	
None	0
Only when moving or position related	1
Even when immobile	2
Pain or discomfort in the morning during first steps	
Less than 1 minute	0
Between 1 and 15 minutes	1
More than 15 minutes	2
Pain or discomfort when standing	
No	0
Yes	1
Pain or discomfort when walking	
None	0
Only after some distance	1
Immediately and increasing with distance	2
Do you have pain around the hip when sitting for a long time?	
No	0
Yes	1
Maximal walking distance	
No limitation	0
Limited but more than 1 kilometer	1
About 1 km or 15 minutes	2
500 to 900m	3
300 to 500m	4
100 to 300m	5
Less than 100m	6
1 cane or crutch necessary when walking	+1
2 canes or crutches necessary when walking	+2
Limitations during daily living	
picking up an object from the floor	
Without any difficulty	0
Possible but with slight difficulty	1
Possible but difficult	2
Possible but very difficult	3
Impossible	4
Getting out of a car or a deep chair	
No difficulty whatsoever	0
Possible with slight difficulty	1
Possible but difficult	2
Possible but very difficult	3
Impossible	4
Total	
determine total amount of points	

Potential candidates for THR were initially evaluated by a Burkinabese surgeon at the outpatient clinic and asked to fill out the questionnaire. Patients with hip fracture were excluded in this phase of the score introduction. Patients were asked if they found the questionnaires difficult to fill out. All questionnaires were checked whether all questions were answered.

The hip replacement program is run in a mission based format in which Burkinabese surgeons work in cooperation with two experienced Belgian hip surgeons. The structure of the hip program has been described previously (4). Preceding the yearly operating program, a preoperative grouped outpatient clinic is run. At this time patients selected for THR filled out the questionnaire, possibly a second time. Patients who had completed the questionnaire twice were asked whether their pain or functional impairment had changed since the previous consultation when they had filled out the questionnaire the first time. Only patients with a minimal interval between score and re-score of four weeks were included. For all patients, sex, age and profession were recorded.

The Intra-class Correlation Coefficient (ICC) using an absolute agreement definition was calculated to assess the test-retest reliability (6). Cronbach's alpha was calculated as internal consistency test. The mean, standard deviation, minimum and maximum of each outcome measurement were calculated. All statistical analyses were performed using SPSS 21 statistical software.

RESULTS

Thirty seven patients, who visited a hip-outpatient clinic and were possible candidates for hip replacement surgery, filled out a questionnaire. Mean score was 9 (5 to 22 SD 3,95). All questions were answered by all patients: no questions were left blank. Twenty three patients completed the questionnaire twice with a minimum interval of four weeks. Two of them indicated that the pain or functional impairment had increased during the questionnaire interval. These two were removed from further analysis.

Twenty one patients clearly stated that their pain and functional impairment had remained at the same level in between the two scorings (S1 & S2). These patients data were used for further analysis. Mean age was 43.3 years (±10.99) with the oldest patient being 60 years old and youngest being 25 years old. The group consisted of 12 men and nine women. The professions of the patients were recorded (Table 3).

Table 3
Patients professions

Profession	No.
Student	1
Housewife	7
Soldier	2
Teacher	3
Storekeeper	1
Civil servant	1
Cartographer	1
Computer technician	1
Farmer	2
Welder	1
Driver	1
Total	21

Mean score for the first score (S1) was 12.10 ±4.37 for the second score (S2) 12.4 ±4.33. The mean difference between S1 and S2 for an individual patient was 2.05 ±1.7. The maximal difference was 6, the minimal difference 0. The Intra-class Correlation Coefficient (ICC) was 0.896. Reliability statistics showed a Cronbach's Alpha value of 0.893. The two French retranslations of the English score showed no major differences from the original questionnaire.

DISCUSSION

Many scoring systems have been developed to evaluate pain and follow up functional impairment of patients with degenerative osteoarthritis or after THR. Frequently used scoring systems are the Merle D'Aubigné and Postel score (MDP) (2), Harris Hip Score (HHS) (1) and Oxford Hip Score (OHS) (3). MDP and HHS scoring systems involve hip range of motion testing necessitating a physical examination and therefore cannot be obtained over the phone. OHS can be taken by telephone questionnaire but involves questions that were found to be less relevant for our West African patient population. The adapted functional score we introduced does not involve physical examination and can therefore be administered over the phone.

Literature describing results of THR in sub-Sahara Africa is very limited. The Malawi Joint Registry report (7) used the HHS. The authors mention that the patients are middle to upper class and not farmers. Mulimba (8) used HHS in his retrospective report on 27 THRs in 25 patients with sickle cell disease. In this series, 5 patients were lost to follow up and 6 had died; the remaining patients all had improved HHS.

Kingori *et al* (9) undertook a retrospective study to analyse THR procedures based on information found in medical records. They did not use a functional score. They found out that many patients were lost to follow up after the first postoperative visit with 34% of patients getting lost to follow up before the first six months after surgery were over. They specifically state that some patients get lost to follow up in most cases after the first postoperative visit and then only show up in case a problem develops. Use of a simple, telephone based questionnaire might have improved follow-up of the patients. Sene *et al* (10) used the MDP in their retrospective study in 48 THRs in two university hospitals in Dakar. They don't mention any patients lost to follow up but neither clearly mention the postoperative time the scores were acquired.

The patient population in the current THA project in Burkina Faso can be seen as a general population comprising of many housewives and farmers and a high percentage of patients living a long distance from the hospital. Regular outpatient control visits after the initial postoperative period are difficult to organise. To acquire necessary information on the functional impairment before operation and postoperative evolution we needed a simple scoring system that could be taken by telephone questionnaire. The current score was developed with these requisites in mind adding the necessity that questions should be relevant and appropriate for all patients. In this study all patients indicated that they understood the questions. No questions were left blank, illustrating that projected requirements were fulfilled. As an ICC of >0.8 demonstrates a very good correlation (11), the ICC value of 0.896 illustrates an excellent test-retest reliability.

The size of our study population was limited and no comparison with a currently well established score was performed. This limits the validity of our newly established score. Specific habitual and geographical conditions in our patient population, though, necessitated the introduction of a simple, well adapted, non-investigator dependant score that could easily be acquired by telephone questionnaire. We introduced the cross-cultural adaptation of the Lequesne Index and used it routinely under the name 'Ouaga Score' in our Burkinabese practice as a helpful pre- and postoperative tool and to conduct THR results evaluation. We feel that the introduction of the current functional score could be of help in the evaluation of THR in other African studies.

CONCLUSION

The current study has shown that the cross-cultural adaptation of the Lequesne Index, used as Ouaga Score, can be obtained easily and is reliable in a general West African patient population. We recommend the use of the Ouaga Score for functional evaluation and follow-up of total hip replacement in West Africa.

CONFLICT OF INTEREST

All authors certify that they have no financial conflict of interest in connection with this manuscript.

REFERENCES

1. Harris, W.H. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty: an end-result study using a new method of result evaluation. *J Bone Joint Surg (Am).* 1969; **51**(4):737–755.
2. Merle D'Aubigné, R. and Postel, M. Functional results of hip arthroplasty with acrylic prosthesis. *J Bone Joint Surg (Am).* 1954; **36**(3):451-475.
3. Dawson, J., Fitzpatrick, R., Carr, A., *et al.* Questionnaire on the perceptions of patients about total hip replacement. *J Bone Joint Surg (Br).* 1996; **78**(2):185–190.
4. Dossche, L., Noyez, J., Ouedraogo, W., *et al.* Establishment of a hip replacement project in a district hospital in Burkina Faso: Analysis of technical problems and peri-operative complications. *Bone Joint J.* 2014; **96**(2):177-180.
5. Lequesne, M.G. The algofunctional indices for hip and knee osteoarthritis. *J Rheumatol.* 1997; **24**(4):779-781.
6. Haas, M. Statistical methodology for reliability studies. *J Manipulative Physiol Ther.* 1991; **14**(2):119-132.
7. Lubega, N., Mkandawire, N.C., Sibande, G.C., *et al.* Joint replacement in Malawi: establishment of a national joint registry. *J Bone Joint Surg (Br).* 2009; **91**(3):341-343.
8. Mulimba, J.A.O. Management of Avascular Necrosis of Femoral Head (ANFH) in sickle cell disease. *East Cent Afr J Surg.* 2011; **16**(1):89-93.
9. Kingori, J. and Gakuu, L.N. Total hip replacements at Kikuyu Hospital, Kenya. *East Afr Ortho J.* 2010; **4**(2):44–47.
10. Sene, M., Dansoko, A., Ndiaye A., *et al.* Arthroplastie totale de hanche dans l'ostéonécrose aseptique du drépanocytaire au Sénégal: série de 48 prothèses. *Médecine Tropicale.* 2009; **69**(6):573–576.
11. Landis, J.R. and Koch, G.G. The measurement of observer agreement for categorical data. *Biometrics.* 1977; **33**(1):159-174.