

CORRELATIONS BETWEEN FUNCTIONAL INDICATORS IN LUMBAR DISK HERNIA

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Abstract: Evaluation of each case with lumbar disk hernia using a classification system and ranking the severity of the lesions is necessary. The aim of the study was to correlate some functional indicators that are used for patients with lumbar disk hernia. Material and method: The study lot is formed by 103 cases with clinical diagnosis of low back pain accompanied or not by radiculopathy through lumbar disk hernia, examined in the Medical Rehabilitation Clinical Hospital Felix Spa, between January-September 2008. All these patients were investigated with T₁ and T₂ MRI. Results: Correlation between disability, investigated with Oswestry questionnaire, a functional evaluation scale, and infirmity evaluated through AMA Guide criteria, mobility evaluation parameter, was small ($r=0.16$), but significant ($p=0.025$). Life quality indicators registered with MOS SF36 and participation restriction evaluated with AMA, strongly correlate ($r=0.47$), statistically very significant ($p<0.00001$). The strongest correlation was noticed between participation restriction revealed by AMA and variable "Physical function" of MOS- SF36 scale ($r=0.49$) statistically very significant ($p<0.00001$).

Conclusions: Affection of mobility found in lumbar disk hernia had a moderate functional impact on the organism as a whole, infirmity depending on the applied treatment.

Keywords: correlations, functional indicators, disk hernia, infirmity

Rezumat: Scopul lucrării: demonstrarea impactului funcțional cu mai mulți indici de apreciere și corelația acestora în hernia de disc lombară. Material și Metoda: Lotul este format din 103 pacienți randomizați dintre cazurile cu durere lombara joasa, examinați în Spitalul Clinic de Recuperare Băile Felix în perioada ian-sept 2008, investigați cu ajutorul T₁ și T₂ MRI (rezonanța magnetică nucleară), care a confirmat diagnosticul clinic de hernie de disc lombară. Am apelat la indici de apreciere a durerii lombare cu ajutorul chestionarului Oswestry; de evaluare a calității vieții folosind chestionarul MOS SF-36 Health Survey și criteriile AMA Guides care evaluează infirmitatea, bazându-se pe mobilitatea coloanei lombare. Rezultate: Raportarea disabilității investigată cu ajutorul chestionarului sindromului dureros lombar Oswestry, scală de evaluare funcțională, cu infirmitatea evaluată prin criteriile Ghidului Asociației Medicale Americane(AMA), indice de

evaluare a mobilității dovedește o corelație mică($r=0,16$), însă semnificativă($p=0,025$). Indicatorii de calitate a vieții, înregistrați cu SF36 și infirmitatea, înregistrată cu AMA, se corelează puternic ($r=0,47$), foarte semnificativ statistic ($p<0,00001$). Concluzii: Afectarea mobilității frecventă în hernia de disc lombară are un impact funcțional moderat asupra întregului organism dependent de tratamentul aplicat.

Cuvinte cheie: corelații, indicatori funcționali , hernie de disc, infirmitate

INTRODUCTION

Accurate and early diagnosis represents the prerequisite of an efficient treatment. This is the reason why evaluation of the severity of the lesions for each case with the aid of a classification and ranking system is absolutely necessary. Thus, the stadialization and classification system becomes a real „thinking instrument”, which helps us quickly find the way to the adequate treatment (5).

PURPOSE OF THE STUDY

The management goals when treating back pain are to achieve maximal reduction in pain intensity as rapidly as possible; to restore the individual's ability to function in everyday activities; to help the patient cope with residual pain; to assess for side-effects of therapy; and to facilitate the patient's passage through the legal and socioeconomic impediments to recovery (1,2). For many, the goal is to keep the pain to a manageable level to progress with rehabilitation, which then can lead to long term pain relief (1,3). Also, for some people the goal is to use non-surgical therapies to manage the pain and avoid major surgery, while for others surgery may be the quickest way to feel better (4).The conceptual model of the present study started from the premise that clinical evaluation with the aid of investigation scales for pain, disability, life quality, with establishment of some corellations between these domains, together with imagistic evaluation underlie an adequate therapy.

PURPOSE OF THE STUDY

The first objective of the present study was finding a more accurate and safe variant of handling the stadialization and evaluation systems for intervertebral

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disk lesions. The aim of the study was to correlate some functional indicators that are used in cases with lumbar disk hernia.

MATERIAL AND METHODS

The study lot was formed by 103 cases (n=103) with clinical diagnosis of low back pain accompanied or not by radiculopathy through lumbar disk hernia, examined in the Medical Rehabilitation Clinical Hospital Baile-Felix, between January-September 2008. All the subjects included in this study were investigated with T₁ and T₂ magnetic resonance, which confirmed the clinical diagnosis of lumbar disk hernia. Confirmed clinical cases have signed a following protocol, registration of the cases being made according to medical deontology and ethics guidelines.(1)

In order to evidenciate the impact of the lesion on functionality and daily activities, (table 1.) we have used pain appreciation and consecutive disability parameters: Oswestry questionnaire (version 2.0, which is the same that Stanford uses).(5,6) This questionnaire has been designed to give information about the influence of back or leg pain on everyday life. It includes 10 items: pain intensity, personal care, lifting, walking, sitting, standing, sleeping, sex life, social life, traveling. Clinical evaluation with the aid of Oswestry score is extremely useful as for activities of daily living (ADL) are assigned 8 from the 10 existent questions.

Using AMA Guide (7) criteria we have evaluated infirmity that generates disability- measuring mobility of dorso-lumbar column.

Another modality used for measuring the health status was MOS SF-36 Health Survey.(8,9) The SF-36 is a multi-purpose, short-form health survey with 36 questions. The SF-36 includes one multi-item scale that assesses eight health concepts: 1) limitations in physical activities because of health problems; 2) limitations in social activities because of physical or emotional problems; 3) limitations in usual role activities because of physical health problems; 4) bodily pain; 5) general mental health (psychological distress and well-being); 6) limitations in usual role activities because of emotional problems; 7) vitality (energy and fatigue); and 8) general health perceptions.

Disability index AMA Guide and pain scale measured with Oswestry questionnaire may be used in conjunction with other traditional methods for evaluation of the impact of the rheumatic disease, on short or long term. This is the reason why we have refered Oswestry score to the autoevaluated activity with the aid of the items from the autoevaluation questionnaire SF36

RESULTS AND DISCUSSIONS

Correlations between AMA score, obtained for the 103 subjects with disk hernia, with the global and separately on investigation domains Oswestry scores and MOS SF 36 is revealed by the following tables (tabel 1.) and graphics.

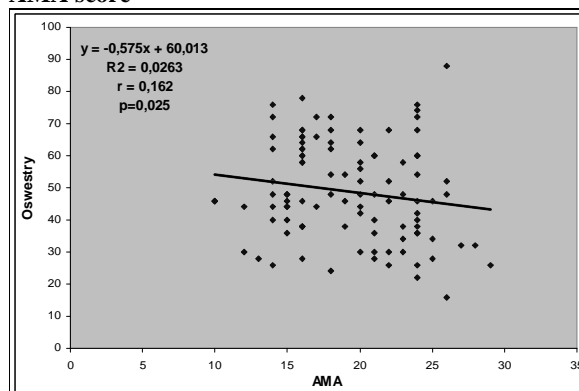
Correlation between disability, investigated with

lumbar pain syndrome scale, Oswestry questionnaire, a functional evaluation scale, and infirmity evaluated through American Medical Association Guide, AMA criteria, a mobility evaluation parameter, was weak (r=0.16), but significant (p=0.025) (Graphic nr. 1).

Table no. 1. Demographic variables and Functional impact

Demographic variables	number	limits	SD	ES
Females / Males	43/64			
Age	48.44	21 - 75	8.55	1.04
Activity (activ/pasiv)	70/33			
Provenance rural/urban	35/68			
Functional impact Oswestry	48,93	16 - 88	15,27	1,571
Score MOS- SF 36	47.07	14,13 – 82.25	17.46	1.468
A.M.A. Guides Criteria	21.89	12 - 31	4.41	0.703

Graphic no. 1: Correlation between Oswestry and AMA score



We have correlated variables investigated by Oswestry scale with infirmity, as an expression of the mobility deficit, obtained after processing AMA Guide criteria and we registered the correlation of three domains: personal care, walking, sleeping.

“Personal care” domain registered with Oswestry questionnaire moderately correlates (r = 0.26), statistically significant (p=0.005) with infirmity measured with American Medical Association Guide (AMA) criteria.

Clinical variable “walking” investigated with Oswestry questionnaire moderately correlates (r = 0.29), statistically very significant (p<0.001) with mobility deficit that generates disability detected with AMA criteria.

Infirmity caused by lumbar disk hernia, evaluated with AMA criteria weakly correlates (r=0.199), statistically significant (p>0.02), with the item "sleeping" of Oswestry questionnaire.

Other domains, such as “weight-lifting”, “sitting position” or “sex life” registered with Oswestry score weakly correlate (r=0.155; r=0.122; r=0.11) with infirmity investigated with AMA criteria, and from the statistical point of view these correlations are not significant

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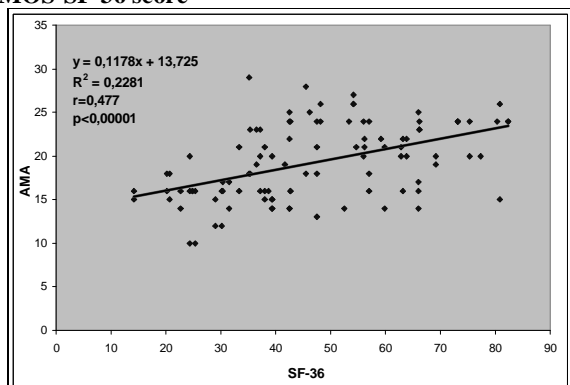
($p > 0.05$; $p > 0.1$; $p > 0.1$).

Correlations AMA – MOS SF-36 domains

We considered useful to appreciate the correlation between domains that registers life quality (MOS SF 36) with participation restriction (AMA criteria) in subjects that were included in this study lot (Table 2).

Life quality indicators registered with SF36 and infirmity, registered with AMA criteria strongly correlate ($r = 0.47$), statistically very significantly ($p < 0.00001$) (Graphic no. 2).

Graphic no. 2: Correlation between AMA and global MOS-SF-36 score



The strongest correlation was noticed between participation restriction revealed by AMA and variable "physical function" of MOS- SF36 scale ($r = 0.49$) statistically very significant ($p < 0.00001$).

A moderate correlation ($r = 0.27$) statistically very significant ($p < 0.005$) between mobility changes that generate disability (AMA criteria) and limitations due to physical health (SF-36) was noticed. Variable "lumbar pain" calculated with MOS SF36 scale moderately correlates ($r = 0.21$), statistically significant ($p < 0.025$) with participation restriction evidenced by AMA score. Activity restriction AMA strongly correlates ($r = 0.30$), very significantly ($p < 0.0001$) with changes of general health status.

Indicators of vitality investigated with SF 36 score correlate ($r = 0.30$) very significantly ($p < 0.0005$) with participation limitation registered with AMA .

Social function domain of SF 36 score strongly correlates ($r = 0.457$), statistically very significantly ($p < 0.000001$) with disability indicators investigated with AMA criteria.

Limitations due to emotional problems strongly correlate ($r = 0.33$), statistically very significantly ($p < 0.00001$) with limitations due to mobility disturbances (AMA).

Physical health status correlates ($r = 0.45$) very significantly ($p < 0.000001$) with limitations of activity AMA.

Indicators of mental health registered with SF36 correlate ($r = 0.45$) strongly significant ($p < 0.000001$) with AMA infirmity.

We have referred Oswestry score to the autoevaluated activity with the aid of the items from the

autoevaluation questionnaire, SF36, the obtained correlation being strong and significant.

Percentual values that indicate the disability of a person as a whole varies between 1/4 and 1/5, based on the diagnosis, and reveals the important impact of the disease on the organism, confirming the definition of this condition, ADL being affected in a proportion of 50% in the majority of the cases.

Table no. 2. Correlations life quality (MOS SF 36) with participation restriction (AMA criteria)

DOMAINS SF36	AMA GUIDES	CORRELATIONS	P
Limitations due to physical health	Disability	$r = 0.27$ moderate	$p < 0.005$
General health status	Activity restriction	$r = 0.30$ very significantly	$p < 0.0001$
Social function	Disability	$r = 0.457$ very significantly	$p < 0.000001$
emotional problems	Disability	$r = 0.33$ strongly correlate	$p < 0.00001$
Physical health	Limitations of activity	$r = 0.45$ very significantly	$p < 0.000001$
Mental health	Infirmity	$r = 0.45$ strongly significant	$p < 0.000001$

AMA Guides criteria are much more objective, depending on exact measurements (7) They reveal that any loss of mobility on a movement direction, no matter of how small it would be (2°) causes dysfunction of the lower extremity, of the whole organism and consecutive affection of ADL.

The strongest correlation was noticed between participation restriction revealed by AMA and variable "physical function" of MOS- SF36 scale, statistically very significant. A moderate correlation statistically very significant between mobility modification that generates disability (AMA) and limitations due to physical health (SF36) was seen. Variable -lumbar pain- calculated with MOS SF36 scale moderately correlates, statistically significant with activity restriction emphasised by AMA score Participation restriction strongly correlates very significantly with changes of general health status. Indicators of vitality investigated with SF 36 score correlate very significantly with activity limitation registered with AMA. Social function domain of investigation of SF36 score strongly correlates, statistically very significantly with disability indicators investigated with AMA criteria. Well mental being registered with SF36 strongly correlates statistically very significantly with infirmity registered by AMA criteria. Limitations due to emotional problems strongly correlate, statistically very significantly with limitations due to mobility disturbances (AMA).

Utility of the conventional evaluation methods, proved by researchers (3,5) was also demonstrated in the

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present paper. These methods assemble in only one score several clinical variables such as: pain, functionality, sleeping, sex life and demographic aspects such as: social and professional life. In this study Oswestry score was helpful for defining the functional status and appreciating the efficiency of the surgical treatment.(6) Our results are largely concordant with the data reported by other researchers.(1,3)

CONCLUSIONS

1. Study of the relation between disability, investigated with Oswestry questionnaire, a functional evaluation scale, and infirmity evaluated with American Medical Association Guide criteria, a mobility evaluation parameter, revealed a weak, but significant correlation.
2. Correlations between variables investigated with Oswestry scale with participation restriction, obtained after processing AMA Guide criteria are different: "personal care" domain-moderate correlation, statistically significant); "walking"-moderate correlation, statistically very significant; "sleeping"-weak correlation, statistically significant .
3. Domains such as "weight-lifting", "sitting position" or "sex life" registered with Oswestry questionnaire weakly correlated with activity restriction investigated with AMA criteria and from the statistical point of view these correlations are not significant.
4. Lack of correlation between the following domains: lumbar pain, orthostatism, social life, professional activity investigated with Oswestry scale and occupational limitation, as the expression of mobility deficit obtained after processing AMA Guide criteria was noticed.
5. Life quality indicators, registered with MOS SF36 and participation restriction, registered with AMA, strongly correlate, statistically very significantly.

Indicators of physical and mental health registered with SF36 correlate strongly significantly with AMA participation restriction.

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