From January 2002 to February 2003, 137 patients complaining of low back pain were treated at the Institute for Orthopedic Surgery "Banjica", Belgrade, Serbia. There were 89 male and 48 female patients aged 13 to 77, mean age 42.2. Their condition was diagnosed through use of radiography, CT, MRI, EMNG, standard battery of neurological tests, and laboratory analyses (urine and blood analysis). Surgical treatment was performed on 39 patients; all other patients received some form of non-surgical care (physical therapy, medication or corset). Treatment efficacy was evaluated by use of the visual analog scales (VAS) and the Oswestry index, before and after treatment. The use Wilcoxon’s pair test revealed statistically significant difference between before and after treatment data on VAS and Oswestry index for all patients.

Key words: lumbar spine, low back pain, Oswestry index, visual analog scale (VAS)

INTRODUCTION

Low back pain is a very common medical condition of modern women and men due to their upright posture and many hours spent sitting. It is hard to diagnose and even harder to treat medically resulting in an enormous socio-economic cost. In addition, discrepancy in low back pain diagnosis - even among spinal surgeons working in the same medical institution and sharing most of their medical training and education - does not make things any better. Thus, differential diagnosis of lumbar spine is still a very challenging area of medical science.

Traditionally, medical diagnosis of diseases and injuries is based on documented changes in the anatomy, changes in chemical content of bodily fluids and tissues, and changes in physiology. Concordances of independent medical observations, or group of observations, are usually recognized as a clinical entities or syndromes. Lumbar diseases are characterized by their specific causes: physical traumas and infectious agents (staphylococcus or tuberculosis). This diagnosis is further detailed with respect to time (acute – less than 2 weeks; sub acute – 2-7 weeks; and chronic), physical capacity (blocked, moveable), psychological reaction and adaptive changes in behavior.

Primary objective of this paper was to systematize causes and treatments of low back pain and to propose best treatment modalities for hospitalized patients. Questionnaires (Oswestry index and VAS) were used to assess outcomes in accordance to the newest North American Spinal Society (NASS) classification of lower back pain:

1. Trauma (skin, ligament, muscle, bone, nerve injuries).
2. Disorders of Specific Sites or Tissues (stenosis, disc, congenital abnormalities).
4. Alignment and Stability (scoliosis, kyphosis, lordosis, olisthesis, hypermobility)
5. Post-treatment (status, complications, pain).
6. Infection and Inflammatory (infections, arthropathy, enthopathies).
7. Metabolic and Hematologic (osteopenias, metabolic, hematologic).
8. Tumors and Tumorous Conditions.
9. Nonspecific and Miscellaneous (pain, psychosocial, lab, syndromes).

MATERIAL AND METHODS

From January 2002 to February 2003, 137 patients complaining of the low back pain were treated at the Institute for Orthopedic Surgery "Banjica", Belgrade, Serbia. There were 89 male and 48 female patients aged 13 to 77, mean age 42.2. Their condition was diagnosed through use of radiography, CT, MRI, EMNG, skeleton scintigraphy standard battery of neurological tests, and laboratory analyses (urine and blood analysis). (Table 1)
According to the criteria used in the NASS classification, there were 22 patients in the first group (trauma), 48 patients in the second group (diseases of specific loci and tissues: stenosis, discus hernia), 1 patient in the third group (neurological diseases), 17 patients in the fourth group (alignment and stability), 4 patients in the fourth group (post surgical), 15 patients in the sixth group (infections), 7 patients in the seventh group (metabolic and hematological), 19 patients in the eighth group (tumors and tumor like conditions). Four patients were classified in the ninth group (non-specific and miscellaneous). Standard neurological examination was performed on all patients and reported 43 patients with no noticeable deficits. Also, there were 94 patients with neurological deficits. In specific, 15 patients with paraparesis, 4 patients with paraplegia, 2 patients with Syndrom conus medullaris, 2 patients with neurological claudication and 71 patients with radiculopathy most frequently affecting either the root L5 (24 patients) or the root S1 (20 patients).

Before being admitted to the hospital 46 patients were treated with NSAID therapy, 17 patients with physical therapy, 33 patients with a combination of NSAID and physical therapy, 4 patients with a plaster corset, 8 with orthosis, 2 patients with a combination of surgery, chemotherapy and radiotherapy. Ten patients had no prior history of medical treatment and 17 patients were admitted to the hospital as urgent.

Among 39 patients that received surgical treatment in the hospital, 13 patients were subjected to discektomy, 12 patients to biopsy, 7 patients to anterior surgery with stabilisation and spondylodesis, 1 patient to spondylodesis intertransversalis, 2 patients to reposition and fixation with Harrington rod, 4 patients to transpedicular fixation (Miami Moss).

Both surgically and non-surgically treated patients received initial polyvalent physical therapy. All surgically treated patients and all patients that were clinically assessed as lacking mobility were treated with adequate doses of Fraxarin for tromboembolic protection. All patients receiving hospital treatment were administered Oswestry index and VAS in order to assess their everyday functioning and intensity of pain. In addition, lumbar lordosis was assessed before and after hospital treatment. Degree of discus degeneration (Modik) was determined in all 62 patients subjected to MRI. Individual scores obtained on Oswestry indexa and VAS, before and after medical treatment were statistically analyzed by Wilcoxon’s pair test.

RESULTS

More male (64%) than female (36%) were hospitalized because of the low back pain. Most prevalent pathology was discus hernia (31 patients), fracture of lumbar spine (17 patients), spondylodiscitis (15 patients) and spondylolisthesis (7 patients). Other types of spinal pathology were sporadic. (Table 2)

Pathology-wise, average patient age was 32.5 for discus hernia, 47.8 for fractures, 43.6 for spondylodiscitis, 53.76 for tumors, and 45.69 for the other. (Table 3)
Neurological deficit was most pronounced in trauma (13) and tumor patients (6) but was not observed in one third of the patients. Less severe neurological deficit was observed mostly in patients diagnosed with degenerative spinal disease. Thus, 38 patients had radiculopathy of L5 - S1 spinal root.

Before being admitted to the hospital 79 patients were subjected to physical therapy and analgesic medication, but with no apparent success. Average sick leave before hospitalization was 100 days, most likely due to improper diagnosis and consequent inadequate treatment. Spondylodiscitis and degenerative conditions were hardest to diagnose properly. The average follow-up of hospitalized patients was 14.27 months.

Thirty-nine of 137 hospitalized patients were subjected to surgery. (Figure 1)

A total of 8 post-treatment complications was observed: 5 among surgically and 5 among non-surgically treated patients. Among surgically treated patients there were: 1 superficial infection, 1 deep infection, 1 lesion of the L4 spinal root, 1 breckage of the rod due to pseudoarthrosis, and 1 perforation of dura. Among the non-surgically treated there were: 1 , 1 infection of urinary tract (due to catheterization), and 1 decubital ulcer.

Average Oswestry index score was 67% and 44%, before and after surgery, respectively. Statistical analysis revealed significant difference between Oswestry index scores before and after treatment for all treated patients (W=1653, p<0.001), surgically (W=703, p<0.001), and non-surgically treated patients (W=210, p<0.001).

Average VAS score was 6.3 and 3.8, before and after surgery, respectively. Statistical analysis of VAS scores revealed significant difference between VAS scores before and after treatment for all treated patients (W=1596, p<0.001), surgically (W=703, p<0.001) and non-surgically treated patients (W=190, p<0.001).

Before treatment, Oswestry index scores were significantly higher in patients that were later subjected to surgery relative to Oswestry index scores in patients that were later treated non-surgically, as evidenced by Mann-Whitney rank sum test (t=314.5, p<0.001).

Before treatment, VAS scores were significantly higher in patients that were later subjected to surgery relative to VAS scores of patients that were later treated non-surgically, as evidenced by Mann-Whitney rank sum test (t = 333, p<0.001).

Lumbar lordosis values among hospitalized patients were significantly lower than in normal population. Comparing lumbar lordosis of our patients (mean = 17.58, standard deviation = 8.17) with average values of lumbar lordosis in normal population revealed statistically significant difference (t = 8.28, p<0.001). However, there was no statistically significant correlation between lumbar lordosis scores and VAS scores (r = -0.164, p> 0.05) before treatment.

### DISCUSSION

Differential diagnosis of low back pain is complex and difficult to establish. Many conditions and diseases of adjacent organs can imitate and irradiate lower part of the back. Different diseases affecting kidneys, bladder, colon, abdominal aorta and female reproductive organs can present low back pain symptoms. Therefore, a whole set of procedures should be involved in the diagnosis including: abdominal and minor pelvis ultrasound, clinical and neurological observation, RTG, CT and MRI, skeleton scintigraphy and the complete blood and urine laboratory. These analyses help as to clearly differentiate specific diagnoses (patients that were treated in the hospital) and non-specific and borderline cases, such as:

1. Instability, that can be caused by progression of adult scoliosis or by progression of degenerative spondylolisthesis. About 20 % of verified RTG instability does not cause any symptoms.
2. Sciatic condition causing pain alongside sciatic nerve. This pain can originate from extra spinal compression (inflammation, circulatory disorder) affecting neural fibers through anatomic projection of sciatic nerve.
3. Strains, sprains, tendinitis and enthesopathies,bursitis and sindroma m.piriformis, further complicate clinical diagnosis of low back pain.
4. Fibromyositis or fibromyalgia is associated with trigger points situated at back muscles and extremely pain sensitive to palpation. It was reported by McCain GA that fibromyalgia can be caused by medical treatment with tricyclic antidepressant and/or exercise regimens.
5. Internal Disc Disruptive Syndrome. This condition is often caused by axial trauma associated with persistent lumbar pain and normal RTG scan. However, pathological changes are detectable trough discogram and MRI - Modik I.
6. Facet Syndrome. Causes of are facet syndrome impinged synovial folds,synovial inflammation,chondromakacia, meniscoid entrapment, cartilage splits and capsular tears.
7. Sacroiliac Syndrome, caused by pathological changes in the joint (infections, arthropatia, arthrosis).

Surgical treatment of low back pain of known etiology should nevertheless be rather restrictive due to often observed recidivism, infections, missed level and site and chronic post-perative ailments. Absolute indications for surgical treatment of discal pathologie,spondylodiscitis, trauma and tumor are: neurological deficit, instability and chronic pain. There are also relative indications for op-
erative treatment, especially applicable for spondylodiscitis and tumors, when diagnostic methods failed to reveal their true etiology.

This study has confirmed that low back pain is a common population ailment calling for exhaustive approach to etiology, careful approach to surgical treatment, and effective and resolute physical rehabilitation. Timely diagnosis and adequate medical treatment will have beneficial effects on duration of sick leaves and the overall cost reduction.

CONCLUSION

Low back pain is a very common condition among ambulatory and hospitalized patients. It is more prevalent in men, older than 30. Etiology is of low back pain is diverse and speckled and hard to diagnose correctly. The use of surgical therapy should be minimized and limited only to cases with absolute indications.

REZIME

U Institutu za ortopedsko hirurške bolesti Banjica, u periodu od januara 2002. do februara 2003. godine, lečeno je 137 bolesnika zbog bola u donjem delu ledja. Distribucija po polu, muškaraca 89, enskih 48, uzrasta od 13 do 77 godina, u proseku, 42,2 godine. Hirurški je lečeno 39 bolesnika a ostali su lečeni neoperativno (procedure fizikalne terapije, mider i medikamentozno). U dijagnostici osim standardnih radiografija, koristili smo i CT, MRI, EMNG, neurološki nalaz i laboratorijske analize. U analizi rezultata koristili smo Oswestry index i VAS (Visual Analog Scale) kako pre tako i posle lečenja. Statističkom analizom pomoću Wilcoxonovog testa equivalentnih parova, obradjeni su Oswestry index i VAS, na osnovu koje analize je dokazana značajna razlika u vrednostima Oswestry indexa i VAS-a, pre i posle lečenja, kako za ukupan broj bolesnika tako i u grupama operativno i neoperativno lećenih.

Ključne reči: lumbalna kičma, low back pain, Oswestry index, VAS

BIBLIOGRAPHY