Local Irrigation of the Surgical Field with Antibiotics in the End of Procedure Reduces the Infection Rate in Herniated Lumbar Disc Surgery

Armend Kërveshi¹, Nehat Halili¹, Bujar Kastrati¹, Faik Qosja¹, Serbeze Kabashi², Sefedin Muçaj^{2,3}

Clinic of Neurosurgery, University Clinical Centre of Kosova, Prishtina¹

Faculty of Medicine, Prishtina University, Prishtina, Republic of Kosova²

National Institute of Public Health of Kosova³

Corresponding author: Ass. Prof. Sefedin Muçaj, MD, PhD. National Institute of Public Health of Kosova, Mother Theresa Street NN., University Hospital Center, 10.000 Prishtina, Republic of Kosova, tel: +377 44 223 782; E-mail: sefa66@gmail.com

ABSTRACT

Introduction: Reported rate of infections after lumbar discectomy is 1%–15 %. This complication may result in disability or even the death.

Aim: The aim of the study is to assess the rate of infection associated with lumbar discectomies when combined systemic and local antibiotic prophylaxis was employed. **Patients and methods:** In this retrospective study we analyzed all patients operated for herniated lumbar disc from 2009 -2012 in our institute. Beside of receiving systemic prophylaxis with 2g of Cefazoline, all patients had their operative field irrigated at the end of operation with Amikacin sulfate injection. Wound was considered infected when local and systemic signs of infection were revealed and were associated with elevated ESR, leukocytosis and elevated CRP. Assessment of infection is done by neurosurgeon during the hospitalization and later at outpatient's clinic along postoperative course of three months. **Results:** A total of 604 patients were operated, of those 285 patients (47.2 %) females and 319 males (52.8 %), 12 patients were operated on two levels (1.98 %). Average patient age was 32.5 years (range 20–65 years) Localization of herniated disc was: in L/2-L/3 20 patients or 3.3 %, the L/3-L/4 level 42 patients or 7 %, the L/4 -L /5 262 patients or 43.3 % at the level L/V- S/1 280 patients or 46.3 %. Three patients (0.49%) developed wound infection, two of them superficial infection only with local signs: local pain, redness and leakage. They were treated with oral antibiotics. One with deep wound infection. He presented with local and systemic signs and treated with i.v antibiotics. All the cultures from wound swab revealed staphylococcus aureus. **Conclusion** Prophylaxis with systemic antibiotic (Cefazoline 2.0) intravenous administration 30 minutes before the incision and irrigation of operative field with local antibiotic Amikacine sulfate at the end of procedure reduces the infection rate in patients operated for herniated lumbar disc when compared with systemic antibiotic prophylaxis only.

Key words: Lumbar discectomy, systemic antibiotic prophylaxis, local space irrigation with antibiotics, infection.

1. INTRODUCTION

Every operation carries danger for infection. Surgery for lumbar disc is the most common neurosurgical procedure (1). The introduction of the microscopic discectomy by Caspar W and Yasargil MG in 1977 (2, 3) the infection rate of the procedure has been significantly reduced, mainly due to the less damage to the tissue. At the moment, the reported rate of infection after disc surgery is between 1 % and 15 % (4). Infection can be disabling, it requires a long time treatment with bed rest and antibiotics, deformity, chronic pain, even death. It is well known that systemic antibiotics prophylaxis reduced the incidence of infection (5). However, there is little evidence for the effect of the local irrigation of operative field with antibiotics at the end

of procedure at the infection rate in herniated disc patients. This paper, based on the experience of a busy neurosurgical department is an attempt to contribute to the wide discussion on this matter. The importance of this study is practical.

2. PATIENTS AND METHODS

In this retrospective study we analyzed patients operated for lumbar discectomy, from 2009–2012 in our institution. During this period 604 patients were operated, including patients operated for the first time, those with recurrent disk disease. Average patient age was 32.5 years (20–65 years). Preparation for operation necessarily includes routine laboratory tests, ERS and CRP, lumbar radiography, spine CT and MRI of the

lumbar region. Assessment of infection is done by neurosurgeon during hospitalization and regular ambulatory visits. Operation technique was microdiscectomy. All of the patients, who were operated, didn't present with any signs of infectious focus elsewhere before surgery. A patient with epidural abscess after lumbar discectomy is excluded from our study because the resident has forgotten a part of the cotton in epidural space. The patients are operated by six surgeons, the average operation time 50 min. The average stay of patients in hospital was 2 days. The 90 % of patients are drained for 12–24h with closed drainage. We use Amikacin sulfate injection diluted with saline solution for irrigation and systemic antibiotic Cefazolin IV 2.0, 30 min prior to surgery or 600 mg Clindamycine in patients allergic to b-lactam antibiotics (15 patients). We stop the antibiotics after third dose in patients without drainage. In patients with drainage antibiotic is discontinued 24 hours after we take of the drainage. The infection is judged by neurosurgeon during regular ambulatory visits, with laboratory analysis, white blood count, ERS, CRP, radiological imaging, MRI for suspicious cases.

3. RESULTS

Results are presented by Tables and Graphs. A total of 604 patients, 285 (47.2%) were females and 319 males (52.8%).

Figure 1. Gender of the patients in the study

Figure 2. Level of the herniation of the lumbar disc

Infection: 3 patients with infection of the wound, two male patients with superficial infection and 1 female diabetic patient with deep infection. All infected patients were smokers and didn't stop smoking even for short time.

Case	Sex	Age	Level of operation	Onset of symptoms after operation	Back pain	Neurological examination	reoperation
1	male	51	L/4-L/5	7 days	+	Normal	No
2	male	42	L/V-S/1	7 days	+	Normal	No
3	female	50	L/4-L/5	5 days	+	Normal	No

Table 1. Clinical features

Case	WBC (mm ³)	ERS, first hour	CRP (C reactive protein)	Temperature
1	6.4	36	68	Normal
2	7.2	47	92	Normal
3	9.3	60	110	38 C max

Table 2. Laboratory analysis

With the wound swab staphylococcus aureus is isolated to the three cases; two patients had superficial wound infection and were treated with oral tablets, Cefuroxime 500 mg 2x1 for 10 days, according to sensitivity with antibiogram, the patient with deep wound infection was treated with Vankomycine amp. 500 mg I.V. 3x1 for 10 days.

4. DISCUSSION

Infections after lumbar disc surgery are not frequent (6). The surgeon must be very vigilant to reduce their incidence as much as possible. According to the previous similar study in our institution with only systemic antibiotic prophylaxis, at that period the infection rate after lumbar discectomy was 2.7 % (1.6% discitis and 1.1% wound infections). Results obtained in this study show us that the addition of local antibiotic is effective in reducing the rate of infection after lumbar discectomy compared with the rate of infection after prophylaxis with systemic antibiotics only. Our results are similar to studies done worldwide regarding infections after lumbar discectomies 1 % -10 % (4).

The idea for choose Amikacin sulfate was: local activity, effective against staphylococcus and gram negative bacteria, the most common agents of infections after these procedures.

As in other studies diabetes and smoking was a risk factor for infection (8, 9), due to the impaired function of leukocyte, the angiopathy, and poor supply of oxygen to the tissues and poor penetration of the antibiotic in area.

Meticulous surgical work, good fascial closure, correct hemostasis, frequent space irrigation with saline, treatment of high blood sugar (8), abstinence of smoking (9), good nourishment (10) are very important factors which together with systemic and local antibiotic prophylaxis help to prevent infections after lumbar discectomies.

5. CONCLUSION

Our study showed that systemic antibiotic prophylaxis and addition of local antibiotic irrigation of space is effective in reducing the rate of infection after surgery for herniated lumbar disc compared with the rate of infection after prophylaxis with systemic antibiotics only.

CONFLICT OF INTEREST: NOTHING TO BE DECLARED.

REFERENCES

1. Mark S. Greenberg. Handbook of Neurosurgery, Fifth Edition Thieme. 2001: 285-231.
2. Yasargil MG. Microsurgical operation of Herniated Lumbar disc.

- Advances in Neurosurgery. 1977; 4: 81-82.
3. Caspar W. A new surgical procedure of lumbar disc herniation causes less tissue damage through a microsurgical approach. Advances in Neurosurgery. 1977; 4: 74-80.
 4. Stolke D, Sollman WP, Seifert V. Intra and postoperative complications in lumbar disc surgery. Spine. 1989; 14: 56-59.
 5. Horowitz NH, Curtin JA. Prophylactic antibiotics and wound infections following laminectomy for lumbar disc infections, a retrospective study J Neurosurg. 1975; 43: 727-731.
 6. Ford LT, Key JA. Postoperative infections in intervertebral disc space. Southern Medical Journal. 1955; 48: 1295-1303.
 7. Hasani A, Kastrati B, Kerveshi A, Elshani B. Complications of lumbar disc surgery during Five year Period. 4th Congres of the Croatian Neurosurgical Society, Zagreb, Croatia November. 2005: 9-12.
 8. Simpson JM, Silveri CP, Balderston RA, Simeone FA, An HS. The results of operation in lumbar spine in patients who have the diabetes mellitus. J Bone J Surg Am. 1993; 75: 1823-1829.
 9. Jensen JA, Goodson WH, Hopf HW, Hunt TK. Cigarette smoking decreases tissue oxygen. Arch surg. 1991; 126: 1131-1134.
 10. Klein JD, Hey LA, Yu CS. et al. Perioperative nutrition and post-operative complications in patients undergoing spinal surgery. Spine. 1996; 21: 2676-2682.

EUROPEAN FEDERATION for MEDICAL INFORMATICS

[Home](#)
[About](#)
[Working Groups](#)
[Institutional Members](#)
[Events](#)
[Past Conferences](#)
[Publications](#)
[Contact](#)

MIE 2015, Madrid

The European Federation for Medical Informatics (EFMI) and the Spanish Society of Health Informatics (SEIS), Spain invite you to submit your contribution to the 26th Medical Informatics Europe Conference, MIE2015, which will be held from 27 to 29 May 2015 in Madrid, Spain.

[Read more: MIE 2015, Madrid](#)

Call for Papers MIE 2015

The chosen theme of MIE2015 is "Digital healthcare empowering Europeans", addressing a range of important aspects, relating to opportunities for or impact of new approaches and IT tools in day-to-day life affecting the citizens. The conference theme aligns with collective efforts of multiple parties; Patients, care providers, system developers, researcher and ultimately the entire population of Europe to join in to enjoy benefits from the potentialities in digitization of health information.

[Read more: Call for Papers MIE 2015](#)

Call for Papers pHealth 2015

pHealth 2015 opens a new chapter in the success story of the series of international conferences on wearable or implantable micro and nano technologies for personalized medicine. Starting in 2003 with personal health management systems, pHealth has evolved to a truly interdisciplinary event by covering technological and biomedical facilities, legal, ethical, social, and organizational requirements and impacts as well as necessary basic research for enabling the future proof care paradigms.

Upcoming Events

09 FEB	Mon Feb 09 @12:00AM IHIC 2015 - 15th International HL7 Interoperability Conference
27 MAY	Wed May 27 @12:00AM MIE 2015 - Madrid
09 JUL	Thu Jul 09 @ 8:00AM - 05:00PM ICIMTH 2015
06 SEP	Sun Sep 06 @12:00AM GMDS 2015 Conference

Login

☐ Remember Me

Log in