



## Original article

ACTA FAC MED NAISS 2007; 24 (4): 195-199

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## NUTRITION SCREENING IMPORTANCE FOR PATIENTS THAT UNDERWENT RADICAL CYSTECTOMY

## SUMMARY

The aim of this study was to confirm the significance of introducing perioperative nutrition screening for patients who have undergone radical cystectomy so as to motivate them to have proper nutrition protocol introduced in future.

This pilot research involved 14 patients with urinary bladder cancer treated at the Urology Clinic in Nis, from September 1, 2005 to March 1, 2007. All the patients had undergone a surgical procedure of radical cystectomy with urinary diversion. Postoperatively, all the patients were treated with total parenteral and enteral nutrition, while indication for starting a liquid diet was the point when peristalsis occurred. Nutrition parameters were measured preoperatively and on the first, third and fifth day following the surgery. Nutrition parameters included body mass index, lymphocyte count, protein and albumin values. The data were analyzed by means of quantitative analysis methods. For the analysis of the research results we used the statistic package SPSS 10.0.

Only 1/3 of the patients in our research was malnourished. There were 71.43% of the patients with a depleted number of lymphocytes preoperatively, while there were 42.86% with lower than normal value of protein. Preoperatively, hypoalbuminemia was present in all the patients, whereas albumin level was very low in almost 1/3 of the patients, less than 35g/l. The later the nasogastric tube was removed and the later a liquid diet was introduced, the greater frequency of postoperative complications appeared in these patients.

Nutrition screening should encompass anthropometric and biochemical parameters as they complement each other. Earlier beginning of per os nutrition decreases the frequency of postoperative complications.

*Key words:* nutrition screening, radical cystectomy, complications

## INTRODUCTION

Urinary bladder cancer is the second most common cancer of genitourinary tract in our and most other countries (1). In the last 35 years, radical cystectomy has been a golden standard for the treatment of patients with invasive urinary bladder cancer (2).

Radical cystectomy with urinary diversion is a major surgical procedure which consists of en block cystectomy with bilateral dissection of pelvic and iliac lymph nodes and some type of reconstruction of lower urinary tract. This operative procedure is associated with significant intraoperative bleeding, high perioperative stress and postoperative food restriction (3, 4). Improving

surgical, medicamentous and anaesthesiology treatment reduces morbidity and mortality of this surgical procedure.

Radical cystectomy also carries a potential of a great nutritional risk (5). Patients who undergo this surgery are mostly elderly people on lower functional reserve, with different degree of organ and organ system damage and with different degree of malnutrition. Mechanical bowel preparation is an important part of preoperative assessment of patients for radical cystectomy. This procedure also has a potential for a nutritional risk (6).

Perioperative nutrition screening in surgery is rare in our country; however, it represents an important problem to seek solution for in the rest of the world (7, 8).

#### AIMS

The aim of this study was to confirm the significance of introducing perioperative nutrition screening in patients who have undergone radical cystectomy so as to motivate them to have proper nutrition protocol introduced in future.

#### MATERIAL AND METHODS

This pilot research involved 14 patients with urinary bladder cancer treated at the Urology Clinic in Nis, from September 1, 2005 to March 1, 2007. All the patients had undergone a surgical procedure of radical cystectomy with urinary diversion. Radical cystectomy was indicated based on a cystoscopic examination and biopsy, both of which pointing to invasive urinary bladder cancer. Pathology diagnosis was set postoperatively by grading primary tumour and lymph nodes according to tumour-necrosis-metastasis classification (TNM classification) set in 1987 (9) supplemented in 2002 (10). A criterion used to exclude patients from this research was their hospitalization within the period of three months prior to planned surgical intervention took place.

Nutritive screening was performed for all the patients, 48 hours preoperatively. It encompassed determining of body mass index (BMI) (after the patients' body height and body mass were determined, as a part of a standard procedure) and measuring of lymphocyte (Lym) count and protein (Pro) and albumin (Alb) values. Normal values used in a referent for Lym were between 0.4- 4.4.x 10<sup>9</sup>/l, but we used 2.2x 10<sup>9</sup>/l as a lower limit, for Pro we used 63- 80g/l, and for Alb we used 54- 64g/l.

Mechanical bowel preparation was performed in all the patients in the period of 48 hours prior to their surgery. On the evening before and two hours preoperatively, all the patients received anticoagulant protection.

Intraoperatively, all the patients received antibiotic prophylaxis and had a nasogastric tube set. Blood losses greater than 500ml were compensated for intraoperatively by means of autologous blood that was saved, and in cases when it was contaminated with urine, homologous blood was used.

Postoperatively, all the patients were treated with total parenteral and enteral nutrition, while indication for starting a liquid diet was the point when peristalsis occurred. Nutrition parameters were measured preoperatively and on the first, third and fifth day following the surgery.

"Major" and "minor" complications were followed. "Major" complications were defined as all surgical complications that led to relaparotomy of patients (dehiscence, fistula, abscess and other). "Minor" complications were not analysed as they did not influence significantly the nutrition status of the patients.

The data were analyzed by means of quantitative analysis methods. The results were processed by computer, in Excel Office XP and SPSS 10.0.

#### RESULTS

Basic characteristics of the patients are shown in Table 1.

Table 1. Basic characteristics of the patients (n=14)

Parameter	Women	Men
Gender (%)	2 (14.28)	12 (85.71)
Average age in years xsr± SD	70 ± 1	63.58 ± 5.68
Place of living		
Village (%)	2 (14.28)	6 (42.86)
Town (%)	-	6(42.86)
Tumor pathology classification (%)		
pT0 ili pT1	-	1 (7.14)
pT2	-	4 (28.57)
pT3	-	7 (50)
pT4	2 (14.28)	-
N	2 (14.28)	3 (21.43)
Type of operation		
Mainz pouch	2 (14.28)	9 (64.28)
Hautmann	-	1 (7.14)
Ileal duct	-	2 (14.28)

There were significantly more men among the patients ( $t= 3.78, p<0.01$ ) included in this research.

The average age of male patients was a bit lower compared to the age of female patients. The youngest patient was 53 and the oldest one 72 years old.

Men were equally from village and town, while women were only from village.

Unfortunately, the greatest number of patients (50%) suffered from a progressive disease with TNM stage of pT3, and in the only two female patients the disease had progressed even to stage pT4 and they had positive nodes.

The most frequent type of surgery was Mainz pouch in 9 (64.28%) men and 2 (14.28%) women.

Table 2. Preoperative nutritive screening (n=14)

Parameter	Women (%)	Men (%)	Total (%)
BMI (kg/m <sup>2</sup> ) >25	-	1 (7.14)	1 (7.14)
18-25	1 (7.14)	8 (57.14)	9 (64.28)
<18	1 (7.14)	3 (21.43)	4 (28.57)
Lower Lym count (%)	2 (14.28)	8 (57.14)	10 (71.43)
Pro <63g/l (%)	-	6 (42.86)	6 (42.86)
Alb <35g/l (%)	-	4 (28.57)	4 (28.57)

Table 2 shows that great majority of patients was well-nourished, while approximately 1/3 of patients were malnourished. Only one patient was obese.

There were 71.43% of patients of both sexes with lower lymphocyte count preoperatively, while 42.86% of male patients were with lower protein value. Preoperatively, hypoalbuminemia was present in all the patients, whereas albumin level was very low with almost 1/3 of the patients, less than 35g/l.

Table 3. "Major" complication frequency in relation to preoperative nutritional state of patients

BMI (kg/m <sup>2</sup> )	With complications	Without complications	Total
r 18	4	6	10
<18	1	3	4
Total	5	9	14

Table 3 presents "major" complication frequency related to body mass index. About half of the patients that were well-nourished had "major" complications compared to about 1/3 of malnourished patients.

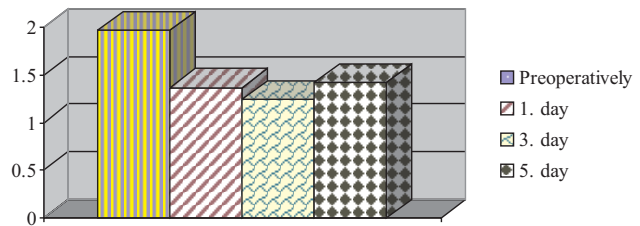


Figure 1. Average perioperative lymphocyte count (n=14)

Figure 1 shows that lower number of lymphocytes was present in all the patients on the third and fifth day following the surgery and in more than 2/3 patients before they had undergone surgery.

Table 4. "Major" complication frequency in relation to preoperative lymphocyte count

Lym	With complications	Without complications	Total
Normal Lym count	1	3	4
Lower Lym count	4	6	10
Total	5	9	14

There were 10 patients with lower preoperative Lym count, and 4 of them experienced major complications.

Table 5. "Major" complication frequency in relation to preoperative protein and albumin value

Protein (g/l)	With complications	Without complications	Total
>63	3	5	8
<63	2	4	6
Ukupno	5	9	14
Albumin (g/l)	With complications	Without complications	Total
>35	4	6	10
<35	1	3	4
Total	5	9	14

Among hypoproteinemic patients, there were 2 patients who experienced complications, whereas among hypoalbuminemic patients, there was one patient.

Statistically, in the patients who started per os nutrition earlier, lower frequency of postoperative "major" complications occurred (Table 6).

Table 6. "Major" complication frequency related to the beginning of per os nutrition

Beginning of per os nutrition (day) xsr ± SD	With complications	Without complications
	8 ± 3.29	5.3 ± 2.05

The patients who had a nasogastric tube removed later (in the period between the fifth and the sixth day) experienced complications when compared to the patients whose nasogastric tube was removed in the period between the fourth and the fifth day, who did not experience complications (Table 7).

Table 7. "Major" complication in relation to nasogastric tube removal

	With complications	Without complications
Time of nasogastric tube removal (day) $\bar{x} \pm SD$	4.6 $\pm$ 1.02	3.8 $\pm$ 1.09

### DISCUSSION

More than 3/4 of our patients were male, which is consistent with the literature (2, 11).

According to some studies, rural environment has a negative impact on aetiology of urinary bladder cancer because of the influence of pesticides (2, 11). In our study, there were more patients who lived in a village compared to those who live in a town.

In our country, the patients' illness was of greater progress when they started to complain about the symptoms compared to other countries (12). This can be explained as low health culture of the common people in our country.

Greater number of Mainz pouch type of surgical interventions in our study is in accordance with the literature data (13) and is probably a result of its relative simplicity, an estimate of a surgeon and, predominantly progression of disease.

Table 2 shows that in preoperative nutritive screening of patients with urinary bladder cancer there is a necessity to analyze and compare both anthropometric and biochemical parameters because neither of them alone is sufficient for estimation. For example, there were four malnourished patients with lower BMI, while 10 patients had preoperative lower Lym count, which is also a parameter of under-nutrition.

Patients had the lowest Lym level on the third day, and then it started to rise. This can be explained by early postoperative stress and the beginning of parenteral nutrition on the first day following the surgery. According to our results, all the patients had lymphopenia on the third and the fifth day postoperatively, so it can be concluded that

lymphocyte count is not a specific parameter for nutrition screening.

Table 4 indicates that the patients with preoperative lower lymphocyte count did not experience a greater frequency of complications compared to the patients with normal lymphocyte count, which is consistent with the previous statement made on Lym count nutrition specificity as a single parameter.

Data analysis shows that preoperative low protein and albumin values are not specific parameters considered for developing "major" complications. As was explained, complications that demanded laparotomy revision occurred only in 1/3 of preoperatively hypoproteinemic patients and 1/4 of severely hypoalbuminemic patients. These results are in accordance with the literature data (5) that point out the impact of hypoalbuminemia on morbidity and mortality. Therefore, albumin is a parameter important for prognosis and not for nutrition.

Our results are in correlation with results of other studies (12, 14) about early beginning of per os nutrition. In those studies, there is even recommendation for medicamentous stimulation of peristalsis in the first 48 hours and there is a trend of avoiding narcotic analgesics, all with the purpose to start per os nutrition earlier. Our results differ a lot compared to the results of other authors, when per os nutrition started on the second postoperative day (12) or on the second to the fifth day (14) following the surgical intervention.

Recommendations vary according to the time of nasogastric tube removal, from 6-8 hours after operation (14) to the first postoperative day (12), but there is a common agreement that it is desirable for gastric decompression intraoperatively and early postoperatively. Longer nasogastric tube withholding carries a risk of development of "major" and "minor" complications (15, 16). Our study is related to these data.

### CONCLUSION

Nutrition screening should encompass anthropometric and biochemical parameters as they complement each other. Earlier beginning of per os nutrition decreases the frequency of postoperative complications. Later nasogastric tube removal was related to greater frequency of "major" postoperative complications' occurrence.

## REFERENCES

- Petrovic B. Epidemiološka studija raka mokraćne bešike. Doktorska disertacija. Medicinski fakultet Niš 1996.
- Stein JP, Lieskovsky G, Cote R, Groshen S, Feng AC, Boyd S. et al. Radical cystectomy in the treatment of invasive bladder cancer: long term results in 1054 patients. *J Clin Oncol* 2001; 19: 666-75.
- Chang SS, Baumgartner RG, Wells N, Cookson MS, Smith JA Jr. Causes of increased hospital stay after radical cystectomy in a clinical pathway setting. *J Urol* 2002; 167: 208-11.
- Gonzalez AG, Ovalle RH, Bbarrera JA. Morbidity and mortality from ileal duct and its relationship with post-surgical total parenteral nutrition. *Nutr Hosp* 2006; 21: 511-6.
- Isabel M, Correia T D, Waitzberg DL. The impact of malnutrition on morbidity, mortality, length of hospital stay and costs evaluated through a multivariate model analysis. *Clin Nutr* 2003; 22: 235-9.
- Heymann TD, Chopra K, Nunn E, Coulter L, Westaby D, Murray-Lyon I M. Bowel preparation at home: prospective study of adverse effects in elderly people. *BMJ* 1996; 313: 727-8.
- Maffezzini M, Gerbi G, Campodonico F, Parodi D. A multimodal perioperative plan for radical cystectomy and urinary intestinal diversion: effects, limits and complications of early artificial nutrition. *J Urol* 2006; 176: 945-8.
- Stomnin L. How long should patients fast before surgery? Time for new guidelines. *Br J Anaest* 1993; 70: 1-3.
- Hemanek PS. I.H. UICC- International union against cancer. TNM Classification of malignant tumors (ed 4). Springer-Verlag, Heidelberg, 1987: 133-5.
- Osterlinck W, Lobel B, Jakse G, Malmstrom PU, Stockle M, Sternberg C. Guidelines on bladder cancer. *Eur Urol* 2002; 41: 105-12.
- Hadži - Đokic J i Goldner B. Tumori mokraćne bešike. *Elit medica*, Beograd, 1998: 7-8.
- Pruthi RS, Chun J, Richman M. Reducing time to oral diet and hospital discharge in patients undergoing radical cystectomy using a perioperative care plan. *Urology* 2003; 62: 661-5.
- Calomino N, Oliva G, Malerba M, Gattuso A, Giovannelli V, Clemente ML. et al. Is total parenteral nutrition necessary in patients subjected to radical cystectomy? *Minerva Urol Nefrol* 2000; 52: 57-61.
- Maffezzini M, Gerbi G, Campodonico F, Parodi D, Capponi G, Spina A, et al. Peri-operative management of ablative and reconstructive surgery of invasive bladder cancer in the elderly. *Surg Oncol* 2004; 13: 197-200.
- Schuster TG, Montie JE. Postoperative ileus after abdominal surgery. *Urology* 2002; 59: 465-71.
- Smith JA Jr. Early and late treatment related morbidity following radical cystectomy. *J Urol* 2005; 173 : 2033-4.

## ZNAČAJ SPROVOĐENJA NUTRITIVNOG SKRININGA KOD BOLESNIKA SA RADIKALNOM CISTEKTOMIJOM

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### SAŽETAK

**Cilj rada bio je potvrđivanje značaja uvođenja perioperativnog nutritivnog skrininga kod bolesnika kod kojih je urađena radikalna cistektomija kako bi se motivisalo uvođenje odgovarajućeg protokola.**

Ovim pilot istraživanjem obuhvaćeno je 14 bolesnika sa karcinomom mokraćne bešike lečenih na Urološkoj klinici u Nišu u periodu od 1. 9. 2005. do 1. 3. 2007. godine. Svi ispitanici su hirurški lečeni radikalnom cistektomijom sa urinarnom diverzijom. Postoperativno, svi ispitanici su dobijali totalnu parenteralnu i enteralnu ishranu, dok je per os unos hrane započinjan sa početkom pojave peristaltike. Parametri ishranjenosti određivani su preoperativno i prvog, trećeg i petog dana postoperativno, a obuhvatali su određivanje: indeksa telesne težine, broja limfocita, vrednosti proteina i albumina. Za procenu postavljenih hipoteza korišćen je statistički metod kvantitativne analize. Rezultati su kompjuterski obrađeni u okviru programa Excel Office XP i SPSS 10.0.

Samo 1/3 pacijenata obuhvaćenih našim istraživanjem bilo je pothranjeno. Snižen broj limfocita preoperativno imalo je čak 71.43% bolesnika, dok je sniženu vrednost proteina imalo 42.86%. Hipoalbuminemija je bila prisutna kod svih pacijenata preoperativno, dok je kod oko 1/3 bolesnika vrednost albumina bila izrazito niska <35g/l. Pacijenti kojima je kasnije izvađena nazogastrična sonda i koji su kasnije počeli per os unos hrane, imali su češće postoperativne komplikacije.

Nutritivni skrining bolesnika sa radikalnom cistektomijom trebalo bi da obuhvati antropometrijske i biohemijske parametre s obzirom na to da se oni međusobno dopunjuju.

Raniji unos hrane na usta smanjuje učestalost komplikacija kod bolesnika sa karcinomom mokraćne bešike i urađenom radikalnom cistektomijom.

**Ključne reči:** nutritivni skrining, radikalna cistektomija, komplikacije