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Risk factors of early postoperative complications in their interaction with results of transurethral resection of prostate in patients with benign prostatic hyperplasia

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In this work, the frequency and structure of early postoperative complications in patients with benign prostatic hyperplasia after transurethral resection of the prostate have been determined, the risk factors that contribute to their development, the correlation between them and the effect of influence in the form of relative risk are revealed.

Key words: *benign prostatic hyperplasia, transurethral resection of the prostate, early postoperative complications.*

With the increase in the number of patients with benign prostatic hyperplasia (BPH), issues of the choice of adequate treatment tactics are updated [2, 7]. Against the background of surgical treatment, which is most effective, the patients increasingly prefer conservative treatment. However, the surgical intervention increases the risk of the development of complications of both the most progressive disease and surgery in the case of its non-inferiority. The frequency of postoperative complications, according to various authors, may reach 70%, requiring a systematic study of their structure and causes [5, 7, 8]. First of all it concerns transurethral resection of the prostate (TURP) – the «gold standard» of surgical treatment of BPH [3, 6]. The solution of this topical issue is directly related to the identification of the risk factors of early postoperative complications and the possibility of their leveling or correction [9, 10].

MATERIALS AND METHODS

266 case histories of patients with BPH after transurethral resection of the prostate in 2015–2016 were subjected to retrospective study, of which 141 were urgently hospitalized and 125 were planned hospitalized. Diagnosis is verified based on the results of the examination in according to the standards defined by the clinical protocol. All patients with some exceptions were treated by Alpha-adrenoblokers monotherapy (ABM) ,the period from 6 months up to 12 years .

Statistical processing of the material was carried out using licensed software packages of descriptive statistics (Microsoft Excel 2007 and Statistica 6.0). There were also used Student's criterion, correlation analysis by the Spirman method, and the odds ratio (OR) and its 95% Confidential Interval were determined [1, 4].

RESULTS

In the process of retrospective study of 266 case histories of patients with BPH after TURP, the frequency and nature of early postoperative complications were determined in (172 patients – 64.7%). They are presented as follows: imperative urges – 42.6%, transient urinary incontinence – 16.7%, exacerbation of chronic pyelonephritis – 11.6%, aseptic leukocyturia – 11.2%, hemotamaponade of the bladder – 5.0%, stress urinary incontinence – 4.3%, recatheterization – 3.1%, acute cystitis – 2.7%, acute epididymitis

Table 1

Results of correlation analysis by Spirman method (planned TURP)

Factors	1	2	3	4	5	6	7	8	9	10	11	12
1	-	0,48097	0,301	-	-	0,375	0,319	-	-	0,221	0,323	0,498
2	0,4809	-	0,889	0,386	0,298	0,399	-	-	0,245	0,293	0,261	-
3	0,469	0,889	-	0,322	-	0,387	-	0,365	-	0,322	0,353	
4	-	0,386	0,322	-	0,721	0,248	-	0,697	0,238	0,335	0,435	-
5	-	0,293	-	0,721	-	-	-	0,39	0,353	-	0,288	-
6	-	0,399	0,387	0,248	-	-	0,428	-	-	0,340	0,503	0,391
7	0,319	-	-	-	-	0,428	-	-	-	-	-	-
8	-	-	0,365	0,697	-	-	-	-	0,353	0,307	-	0,360
9	-	-0,245	-	-0,238	-0,353	0,340	-	-0,353	-	-0,223	-0,218	-
10	-	-	-	0,335		0,340	0,307	0,307	-0,223	-	0,607	0,409
11	-	0,261	0,353	0,435	0,288	0,503	0,360	0,368	-0,218	0,607	-	0,423
12	0,498	0,311	0,404			0,391					0,413	

Note: Only reliable coefficients are presented:

1. Age
2. Duration of the disease
3. Duration of ABM
4. Intravesical prostatic protrusion (IPP)
5. Volume of the prostate (VP)
6. Duration of operation
7. Term of catheter removal
8. Post voiding residual urine (PVR)
9. Maximal flow rate (Q_{max})
10. Quality of life (QoL)
11. (IPSS)
12. Concomitant disease.

Table 2

The results of correlation analysis by the Spirman method (urgent TURP)

Factors		1	2	3	4	5	6	7	8
1	Age	-	0,471	0,456	-	-	-	0,330	0,395
2	Duration of disease	0,471	-	0,844	-	-	-	0,431	0,215
3	Duration of ABM	0,456	0,844	-	-	-	-	0,478	0,321
4	Intravesical prostatic protrusion (IPP)	-	-	-	-	0,559	-	-	-
5	Volume of prostate	-	-	-	0,559	-	-	-	-
6	Duration of operation		-	-	-	-	-	-	-
7	Term of catheter removal	0,330	0,431	0,478		-	-	-	0,287
8	Concomitant disease	0,535	0,285	-	-	-	0,421	0,331	-

Note: Only reliable factors are presented.

Table 3

Factors associated with the complications of the TURP

Parameters under study	OR	LL 95% CI	UL 95% CI
Q_{max} up to 6 ml/s	17,55*	3,35	31,94
Severity of symptoms of IPSS above 25 points	4,45*	1,35	14,65
Term of catheter withdrawal after 7 days and later	3,58*	1,16	11,04
Age above 75 years	3,52*	1,02	12,14
Duration of operation over 30 min	4,57	0,87	23,96
Duration of disease above 3 years	2,16	0,66	7,06
Acute urination retention in anamnesis	3,87*	1,77	8,44
Post void residual urine above 100 ml	1,94	0,59	6,33
Duration of ABM above 3 years	1,88	0,62	5,65
Prostate volume above 80 cm^3	1,25	0,43	3,61
Intravesical prostatic protrusion above 2 cm	1,38*	1,01	3,92
Quality of life, more than 4 points	4,15*	1,29	13,96

Note:
1. OR – ratio of relations;
2. LL 95% CI – lower limit of 95% confidence interval;
3. UL 95% CI – upper limit of 95% confidence interval;
4. * p – the reliability of the indicator of the odds ratio.

– 1.5%, exacerbation of chronic prostatitis – 0.8% and antibiotic-associated diarrhea – in 0.4% of cases. It should be noted that in 48.2% of patients one complication was observed, in 29.0% – two complications, in 16.9% – three and in 5.5% – four to five complications. According to the classification of Clavien-Dindo – 91.3% were of the I – degree of severity, 1.2% in II degree and 7.5% in III degree.

According to analytical-synthetic, comparative analyzes, factors that contributed to the development of early postoperative complications were identified. Attention was focused on accessible, widely used survey methods and anamnesis data as their component. According to the correlation analysis, it was determined how much they are interconnected in their influence on the result of the TURP. Taking into account the known importance of the type of hospitalization, cases of urgent and planned admission of patients to the hospital were allocated (Table 1 and 2).

According to the Tables, a logical chain of Interconnection between the indicators is traced. When summarizing the information given in Tab. 1, it is worth emphasizing the following. Indicator of expressiveness of the symptoms, which prompts the patient to seek medical attention, depends on the duration of the disease, the duration of ABM, the presence of concomitant disease, IPP, PVR, Qmax. From this, it looks justified, and with such factors as the duration of the operation and the term for the removal of the catheter, which is essentially related to the effective. The QoL, which is considered to be one of the determining criteria as the cause of the treatment, together with IPSS, is also interrelated with the IPP, PVR and the two above-mentioned performance indicators. The consideration of clinical experience, the time of surgery and the term of catheter withdrawal are of particular interest. Therefore, it is important to have their relationship with age, duration of illness and ABM, IPP and IPSS, concomitant pathology. When summarizing the data, it is necessary to focus on such factors as the duration of ABM. We emphasize the relationship between it and age, duration of illness, IPP, PVR, QoL, IPSS, concomitant pathology and Duration of operation. A critical assessment from the point of view of clinical experience gives confidence in the likelihood of such dependence. After all, with age, when the patient exhibits a multi organ concomitant pathology more clearly with the BPH, he tries to postpone or avoid surgical treatment and chooses long-term ABM. The result is an increase in the IPSS, deterioration of QoL, and as an objective manifestation are an increase in IPP and PVR. That is, creates a kind of closed circle.

According to the results of the analysis, Table 2, which provides similar information on correlations only for cases of urgent hospitalization, we can find close data. However, they are sort of limitation due to fewer indicators. The term for extracting the catheter is distinguished by its direct connection of the average strength with the patient's age (r=0,330), the duration of the disease (r=0,431) and the duration of the ABM (r=0,478). The connection between IPP and PVR (r=0.559), as well as between the duration of the disease and the duration of ABM (r=0.844), which is more expressive than others, is of practical importance. In assessing the data presented, interest represents the grouping of factors by the strength of their relationship around the duration of ABM.

Based on the needs of clinical practice, the indicators of relative risk (odds ratio) are determined, which shows by how many times the risk of an unfavorable disease prognosis is higher among patients with this factor than among those who have not it. The magnitude of the indicator actually increases the connection between the factor and the phenomenon. Factors associated with complications in patients who underwent the TURP, are presented in Table 3.

Referred to the data in Table 3, it is evident that among all factors the a Q_{max} is highlighted. It is established that with a Q_{max} of up to 6 ml / s, the probability of complications is 17.6 times higher than at 10 ml / s. Since under these conditions the threat of acute urinary retention is formed, the findings are in line with the clinical presentation. The risk of six factors (IPSS, QoL, duration of the disease, age, duration of operation and the term of catheter withdrawal) was close - it was within the range of 3.5–4.5. The risk is almost double in the duration of the disease > 3 years, the duration of the ABM > 3 years, the volume of residual urine > 100 ml, the IPP > 3 cm, the BPH > 80 cm^3, and the men older than 75 years.

Thus, the given data is a versatile confirmation of the importance of the selected factors, controlling the dynamics or preventing the impact of which, it is possible to reduce the risk for development of early postoperative complications of TURP and achieve better quality of medical care for patients with BPH.

CONCLUSIONS

1. The frequency and structure of early postoperative complications in patients with benign prostatic hyperplasia after transurethral resection of the prostate were revealed.

2. The identified risk factors (age, duration of the disease, duration of drug Alpha-adrenoblokers Monotherapy , intravesical prostatic protrusion, volume of prostatic , duration of operation, catheter withdrawal time, Post void residual urine, maximum flow rate, quality of life, severity of symptoms, concomitant diseases), that with different strength of functional dependence are associated with the development of early postoperative complications of transurethral resection of prostate in patients with BPH.

3. Active monitoring and the avoidance of the effects of associated factors may serve as an instrument for preventing the development of early postoperative complications of TURP at the stages of providing medical care to patients with BPH.

Фактори ризику ранніх післяопераційних ускладнень у взаємодії з результатами трансуретральної резекції простати у хворих на доброякісну гіперплазію передміхурової залози

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У дослідженні встановлена частота та структура ранніх післяопераційних ускладнень у хворих на доброякісну гіперплазію передміхурової залози після трансуретральної резекції простати, виявлені фактори ризику, що сприяють їхньому розвитку, визначена між ними кореляційна залежність, а також дана оцінка асоційовано залежним факторам впливовості у формі відносного ризику.

Ключові слова: *доброякісна гіперплазія передміхурової залози, трансуретральна резекція простати, ранні післяопераційні ускладнення.*

Факторы риска ранних послеоперационных осложнений во взаимодействии с результатами трансуретральной резекции простаты у больных доброкачественной гиперплазией предстательной железы

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В исследовании установлена частота и структура ранних послеоперационных осложнений у больных доброкачественной гиперплазией предстательной железы после трансуретральной резекции простаты, выявлены факторы риска, способствующие их развитию, определена между ними корреляционная зависимость, а также дана оценка ассоциировано зависимым факторам в форме относительного риска.

Ключевые слова: *доброкачественная гиперплазия предстательной железы, трансуретральная резекция простаты, ранние послеоперационные осложнения.*

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