Received: 18 February 2023 / Accepted: 22 April 2023 / Published online: 30 June 2023

DOI 10.34689/SH.2023.25.3.016

УДК 616.65-007.61-002.182:303.446.34:(574.41)

PATIENT CHARACTERISTIC OF SURGICAL TREATMENT OF BENIGN PROSTATIC HYPERPLASIA IN THE CITY Of SEMEY SITY: A COHORT STUDY

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Abstract

Aim: The study was done to evaluate pre-operative factors, which influence the post-operative outcome in patients undergoing surgery for Benign Prostatic Hyperplasia (BPH)

Materials and methods: Setting and Design: It was carried out retrospectively at Semey city East Kazakhstan region.

Retrospective cohort study of outcomes of 782 patients with BPH who underwent surgical treatment in the Semei Kidney Center, East Kazakhstan region from 2017 to 2019. All the information was collected from case files of patients. Descriptive statistics were used to analyze the data. For qualitative data Pearson's Chi-square was used.

Results: Most of the patients were admitted to hospital by emergency ambulance, half of the patients had received conservative treatment before, the majority of the patients had delay between the first symptoms and the first present in hospital, patients had one – two diseases as comorbid condition, overweight. The average length of stay in hospital was 10-15 days. Half of patients (53.2%) after treatment recovered, condition improved at 35.8% patients, condition deteriorated at 7.2% patients, without changes were 3.8% patients. Our study defined significant difference between age group (p=0.005), way of admission to hospital (p=0.003), self-referral (p=0.000), severity of condition (p=0.000), comorbid condition (p=0.000), length of hospital stay (p=0.000) and surgical treatment outcomes. There was no significant difference between nationality (p=0.052), rural / urban status (p=0.146), social position (p=0.146), BMI (p=0.411) history of conservative treatment (p=0.064) and surgical treatment outcomes

Conclusion: Aged patients, patients who were admitted to hospital through the unplanned emergency way, self-referral patients had worse outcomes after surgery. Delaying intervention can lead to BPH progression and poorer outcomes. Condition was not changed and deteriorated in patients whom delay was more than a month.

Keywords: *Benign prostatic hyperplasia (BPH), outcome, surgical treatment, Kazakhstan.*

Резюме

ХАРАКТЕРИСТИКА ПАЦИЕНТОВ, ПОДВЕРГШИХСЯ ХИРУРГИЧЕСКОМУ ЛЕЧЕНИЮ ПО ПОВОДУ ДОБРОКАЧЕСТВЕННОЙ ГИПЕРПЛАЗИИ ПРЕДСТАТЕЛЬНОЙ ЖЕЛЕЗЫ, В ГОРОДЕ СЕМЕЙ: КОГОРТНОЕ ИССЛЕДОВАНИЕ

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Цель: оценка предоперационных факторов, влияющих на послеоперационный исход у пациентов, перенесших операцию по поводу доброкачественной гиперплазии предстательной железы (ДГПЖ).

Материалы и методы: Дизайн исследования: ретроспективно в городе Семей Восточно-Казахстанской области.

782 пациентов с ДГПЖ, перенесших оперативное лечение в учреждении «Почечный центр» г. Семей Восточно-Казахстанской области с 2017 по 2019 г. Вся информация была собрана из медицинских карт стационарных

пациентов. Для анализа данных использовалась описательная статистика. Для качественных данных использовался хи-квадрат Пирсона.

Результаты: Большинство пациентов были госпитализированы бригадой скорой помощи, половина пациентов ранее получали консервативное лечение, у большинства пациентов отмечалась задержка мочи между появлением первых симптомов и первым обращением в стационар, у пациентов имелось одно-два заболевания как сопутствующая патология, избыточная масса тела. Средняя продолжительность пребывания в стационаре составила 10-15 дней. Больше половины пациентов (53,2%) после лечения отмечали выздоровление, состояние улучшилось у 35,8% больных, ухудшилось у 7,2% ,у 3,8% пациентов состояние оставалось без изменений. В нашем исследовании выявлены достоверные различия между возрастной категорией пациентов (p=0,005), способом поступления в стационар (p=0,003), самообращением (p=0,000), тяжестью состояния (p=0,000), коморбидным состоянием (p=0,000), продолжительностью пребывания в стационаре (p=0,000) и результатов оперативного лечения. Достоверной разницы между национальностью (p=0,052), сельским/городским статусом (p=0,146), социальным положением (p=0,146), ИМТ (p=0,411), анамнезом консервативного лечения (p=0,064) и результатами оперативного лечения не было.

Заключение. Пациенты пожилого возраста, пациенты, поступившие в стационар в экстренном порядке и пациенты, обратившиеся самостоятельно, имели худшие результаты после операции. Отсрочка вмешательства может привести к прогрессированию ДГПЖ и ухудшению результатов. Состояние не изменилось и ухудшилось у больных, у которых задержка составила более месяца.

Ключевые слова: Доброкачественная гиперплазия предстательной железы (ДГПЖ), исход, оперативное лечение, Казахстан.

Түйіндеме

СЕМЕЙ ҚАЛАСЫНДА ҚУЫҚ АСТЫ БЕЗІНІҢ ҚАТЕРСІЗ ГИПЕРПЛАЗИЯСЫ БОЙЫНША ХИРУРГИЯЛЫҚ ЕМДЕЛУДЕ ЖАТҚАН НАУҚАСТАРДЫҢ СИПАТТАМАСЫ: КОГОРТТЫҚ ЗЕРТТЕУ

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Мақсаты: қуық асты безінің қатерсіз гиперплазиясына (ҚБҚГ) операция жасалған науқастарда операциядан кейінгі нәтижеге әсер ететін операция алды факторларды бағалау.

Материалдар мен әдістері: Зерттеу жобасы: ретроспективті түрде Шығыс Қазақстан облысы, Семей қаласында.

2017-2019 жылдар аралығында Шығыс Қазақстан облысы, Семей қаласындағы Бүйрек орталығының бөлімшелерінде хирургиялық емдеуден өткен 782 ҚБҚГ- сы бар науқас. Барлық мәліметтер стационарлық науқастардың медициналық картасынан жинақталды. Деректерді талдау үшін сипаттама статистикасы қолданылды. Сапалық деректер үшін Пирсонның хи-квадраты пайдаланылды

Нәтижелер: Пациенттердің көпшілігі жедел жәрдем бригадасымен ауруханаға жатқызылды, науқастардың жартысы бұрын консервативті ем қабылдаған, науқастардың көпшілігінде алғашқы белгілердің басталуы мен ауруханаға бірінші келген кезде зәр шығарудың іркілуі, науқастардың ауру ретінде бір немесе екі ауруы болған ілеспелі артық салмақ . Ауруханада орташа болу ұзақтығы 10-15 күн болды. Науқастардың жартысынан көбі (53,2%) емделгеннен кейін сауығып кетті, 35,8% науқастардың жағдайы жақсарды, 7,2% нашарлады, ал 3,8% науқастардың жағдайы өзгеріссіз қалды.

Біздің зерттеуіміз пациенттердің жас санаты (p=0,005), ауруханаға жатқызу әдісі (p=0,003), өзін-өзі жіберу (p=0,000), жағдайының ауырлығы (p=0,000), ілеспелі ауру арасында айтарлықтай айырмашылықтарды анықтады. жағдайы (p=0,000), ауруханада болу ұзақтығы (p=0,000) және хирургиялық емдеу нәтижелері. Ұлты (p=0,052), ауыл/қалалық статус (p=0,146), әлеуметтік жағдайы(p=0,146), ДМИ (p=0,411), консервативті ем тарихы (p=0,064) және хирургиялық емдеудің нәтижесі болмады.

Қорытынды. Егде жастағы науқастар, ауруханаға шұғыл түрде түскен науқастар және өз бетінше жүгінген науқастар операциядан кейін нашар нәтижелерге ие болды. Отаны кешіктіру ҚБҚГ прогрессиясына және одан да нашар нәтижелерге әкелуі мүмкін. Кешігуі бір айдан астам науқастардың жағдайы өзгерген жоқ және одан да нашарлады.

Түйінді сөздер: *Қуықасты безінің қатерсіз гиперплазиясы (ҚБҚГ), нәтиже, хирургиялық емдеу, Қазақстан.*

Bibliographic citation:

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Introduction

Benign prostatic hyperplasia (BPH) belongs to the most frequent diseases in ageing men. In the 4th decade of life, BPH is demonstrable in 30–40% of men, and its prevalence increases almost linearly to 70–80% in those older than 80 years. BPH, however, is a purely histological definition and must be distinguished from benign prostatic enlargement (BPE), which describes an enlarged prostate, and lower urinary tract symptoms (LUTS) [1]. LUTS is defined by several symptoms including urgency, nocturia, frequency, dysuria, and difficulty emptying the bladder, difficulty initiating micturition, and weak or interrupted stream during micturition [2]

After lifestyle modifications, medication is generally first line in the treatment of symptomatic BPH [3]. Two drug classes became accepted standard of care in the late 1980s early 1990s; 5-alpha-reductase inhibitors such as finasteride and Alpha-blockers like terazosin [4].The interventional management of BPH is another option for patients who are suitable for surgical procedure and is generally offered to patients with persistent or severe BPH refractory to medical therapy. For the surgical treatment of BPH there are many options such as Transurethral resection of the prostate (TURP), resection of the prostate through the urethra using monopolarelectrocautery, which has long been considered the historical gold standard. Bipolar TURP, it is resection of the prostate through the urethra using bipolar electrocautery. Holmium laser enucleation of the prostate (HoLEP) - pulsed laser, utilizing a solid medium that combining carbon dioxide and neodymium: YAG lasers to deliver tissue cutting and cauterization [5]. Greenlight laser therapy it is high-powered KTP 532-nm wavelength photoselective vaporization system [6]. Future (researched) and novel therapies such as Silodosin (higher selectivity alpha blocker), NX-1207 & PRX302 (intraprostatic injection), Prostate artery embolization (Embolization of the prostatic artery to prevent growth and promote apoptosis), has shown promising results [7].

In recent years, there has been a noticeable increase of the urological morbidity of the population in Kazakhstan. The peculiarity is that it increases in the elderly group and neglected, chronic forms of diseases that occur against the background of severe pathology, which leads to high mortality [8] [9].

Treatment of BPH in Kazakhstan is considered also many options, but high-tech operations such as laser treatment are available only in large cities as Astana, Almaty. Semey is small city is situated on the East region of Kazakhstan. The problem of BPH is relevant for this region. Option of surgical treatment of BPH in Semey hospitals mainly is TURP. However, little is known about surgical treatment and outcomes. Objective of this study was to analyze the short-term outcomes and patient characteristic of surgical treatment of BPH in Semey city East Kazakhstan region.

Materials and Methods

Study design and procedures

This is retrospective cohort study of 782 patients with BPH who underwent surgical treatment in the Semey Kidney Center, East Kazakhstan region. Overall, this study comprised 782 patients were treated in the Semey Kidney Center from 2017 to 2019. Inclusion criteria include BPH patients aged 40 years and older, and residents of Semey city. Exclusion criteria is 40 year-old patients and younger, patients with prostatic cancer and other prostate diseases, and residents of other region. All information were collected fromcase files ofpatients. Data of participants were encoded with a unique code. The correspondence between this code and personal identification information is stored in a file to which only the database keeper has access. Before data collection was started, the study gained the approval of the Ethics Committee of Semey Medical University (Protocol No 2, October 25, 2018).

Statistical analysis

Descriptive statistics were used to analyze the data. The choice of statistical criteria for data analysis depended on the type of analyzed variables. For qualitative data, Pearson's Chi-square was used. Statistical analysis was performed using SPSS version 20.0 (IBM Ireland Product Distribution Limited, Ireland). The level of statistical significance was set at $p < 0.05$.

Results

A total of 782 subjectsunderwent surgical treatment of BPH from 2017 to 2019 in Semey Kidney Center. The majority of patients were Kazakh nationality (59.7%). Forty-three point one percent of patients were aged 70 years and older. More than half of patients (58.7%) were urban residents. Majority of the participants (70.7%) were retirees. More than half of patients (56.4%) were admitted to the hospital by planned way. Mainly patients (29.0%) were sent to hospital by emergency ambulance. Half of patients (53.2%) after treatment recovered, condition improved at 35.8% patients, condition deteriorated at 7.2% patients, without changes were 3.8% patients. Nearly half of patients (44.5%) received conservative treatment before. Majority of

the patients (62.0%) had one-two diseases as comorbid conditions. Most patients (40.9%) had overweight. Average length of stay in hospital was 10-15 days. The baseline patients' characteristics are presented in Table 1 and 2.

Table1.

Patients' characteristics.

Characteristics	N=782
Kazakh, n (%)	467 (59.7%)
Russian, n (%)	251 (32.1%)
Other nationalities	64 (8.2%)
Age group, y n (%)	
up to 50	12 (1.5%)
51-60	134 (17.1%)
61-70	299 (38.2%)
≥70	337 (43.1%)
Residency n (%)	
Urban n (%)	459 (58.7%)
Rural n (%)	323 (41.3%)
Social positionn (%)	
White-Collar Workers n (%)	42 (5.4%)
Blue-Collar Workers n (%)	88 (11.3%)
Retires n (%)	553 (70.7%)
Unemployedn (%)	31 (4.0%)
Disabled people	37 (4.7%)
Others n (%)	31 (4.0)
Way of admission to hospital n (%)	
Plannedn (%)	441 (56.4%)
Unplanned emergency wayn (%)	341 (43.6%)
Sending to hospital n (%)	
Sending by GP n (%)	167 (21.4%)
Emergency ambulance n (%)	227 (29.0%)
Sending by Urologist	150 (19.2%)
Sending byrural hospital	200 (25.6%)
Self-referral n (%)	38 (4.9%)

Deterioration of condition mainly was observed in the age group of 61-70 (7.4%) and older 70 years (9.2%). Condition is not changed at 5.2% patients of the age group 51-60. Way of admission to the hospital influence to outcome of treatment. Condition is deteriorated when patients were sent by rural hospital (8.0%) and self-referral (10.5%). Condition is not changed at 6.0% patients who were sent by GP. Admission to hospital by unplanned emergency way had worse outcome at 7.3% patients. (Table 3)

Table 2.

Clinical characteristics of patients.

Characteristics	N=782
Severity of condition during hospitalization n (%)	
Mild	385 (49.2%)
Moderate	382 (48.8%)
Severe	15 (1.9%)
Conservative treatmentn (%)	
Yes	348 (44.5%)
No	411 (52.6%)
Information absent	23 (2.9%)
Time between the first symptoms and the first present in hospital n (%)	
Up to 24 hours	131 (16.8%)
Up to 3 days	195 (24.9%)
Up to 10 days	114 (14.6%)
Up to one month	38 (4.9%)
More than one month	304 (38.9%)
Comorbid condition n (%)	
1-2 diseases	485 (62.0%)
3-4 diseases	247 (31.6%)
5-6 diseases	45 (5.8%)
7 and more diseases	5 (0.6%)
BMI	
Underweight	15 (1.9%)
Normal weight	280 (35.8%)
Overweight	320 (40.9%)
Obesity	167 (21.4%)
Length of stay n (%)	
Up to 10 days	224 (28.6%)
10-15 days	243 (31.1%)
16-20 days	209 (26.7%)
21-30 days	101 (12.9%)
31 and more days	5 (0.6%)
Outcome n (%)	
Recovery	416 (53.2%)
Improvement	280 (35.8%)
Condition deteriorated	56 (7.2%)
Without changes	30 (3.8%)

Table 3.

Relation of the variables and treatment outcomes.

	Recovery	Improvement	Condition deteriorated	Without changes	$\chi 2$, df, p
1	2	3	4	5	6
Age group					$\chi 2$=23.518, df=9, p=0.005
up to 50	6 (50.0%)	6 (50.0%)	0 (0.0%)	0 (0.0%)	
51-60	82 (61.2%)	42 (31.3%)	3 (2.2%)	7 (5.2%)	
61-70	176 (58.9%)	93 (31.1%)	22 (7.4%)	8 (2.7%)	
≥70	152 (45.1%)	139 (41.2%)	31 (9.2%)	15 (4.5%)	
Nationality					$\chi 2$=12.464, df=6, p=0.052
Kazakh	259 (55.5%)	160 (34.3%)	33 (7.1%)	15 (3.2%)	
Russian,	125 (49.8%)	100 (39.8%)	13 (5.2%)	13 (5.2%)	
Other nationalities	32 (50.0%)	20 (31.2%)	10 (15.6%)	2 (3.1%)	
Residency					$\chi 2$=2.537, df=3, p=0.469
Urban	251 (54.7%)	163 (35.5%)	31 (6.8%)	14 (3.1%)	
Rural	165 (51.1%)	117 (36.2%)	25 (7.7%)	16 (5.0%)	

Continuation of Table 3

1	2	3	4	5	6
Social position					$\chi2$=20.725, df=15, p=0.146
White-Collar Workers	50 (56.8%)	30 (34.1%)	6 (6.8%)	2 (2.3%)	
Blue-Collar Workers	26 (61.9%)	15 (35.7%)	1 (2.4%)	0 (0.0%)	
Retires	285 (51.5%)	199 (36.0%)	46 (8.3%)	23 (4.2%)	
Unemployed	18 (58.1%)	7 (22.6%)	2 (6.5%)	4 (12.9%)	
Disabled people	22 (59.5%)	14 (37.8%)	1 (2.7%)	0 (0.0%)	
Others	15 (48.4%)	15 (48.4%)	0 (0.0%)	1 (3.2%)	
Way of admission to hospital					$\chi2$=30.658, df=6, p=0.003
Planned	256 (58.0%)	134 (30.4%)	31 (7.0%)	20 (4.5%)	
Unplanned emergency way	160 (46.9%)	146 (42.8%)	25 (7.3%)	10 (2.9%)	
Sending to hospital					$\chi2$=28.690, df=12, p=0.004
Sending by GP	94 (56.3%)	51 (30.5%)	12 (7.2%)	10 (6.0%)	
Emergency ambulance	100 (44.1%)	109 (48.0%)	13 (5.7%)	5 (2.2%)	
Sending byUrologist	93 (62.0%)	40 (26.7%)	11 (7.3%)	6 (4.0%)	
Sending byrural hospital	113 (56.5%)	63 (31.5%)	16 (8.0%)	8 (4.0%)	
Self-referral	16 (42.1%)	17 (44.7%)	4 (10.5%)	1 (2.6%)	
Severity of condition during hospitalization					$\chi2$=14,087, df=3, p=0,000
Mild	233 (60.5%)	102 (26.5%)	34 (8.8%)	16 (4.2%)	
Moderate	177 (46.3%)	170 (44.5%)	22 (5.8%)	13 (3.4%)	
Severe	6 (40.0%)	8 (53.3%)	0 (0.0%)	1 (6.7%)	
Conservative treatment					$\chi2$=11.907, df=6, p=0.064
Yes	196 (56.3%)	107 (30.7%)	30 (8.6%)	15 (4.3%)	
No	212 (51.6%)	160 (38.9%)	24 (5.8%)	15 (3.6%)	
Information absent	8 (34.8%)	13 (56.5%)	2 (8.7%)	0 (0.0%)	
Time between the first symptoms and the first present in hospital					$\chi2$=49.910, df=12, p=0.000
Up to 24 hours	68 (51.9%)	52 (39.7%)	7 (5.3%)	4 (3.1%)	
Up to 3 days	96 (49.2%)	82 (42.1%)	11 (5.6%)	6 (3.1%)	
Up to 10 days	43 (37.7%)	59 (51.8%)	12 (10.5%)	0 (0.0%)	
Up to one month	18 (47.4%)	17 (44.7%)	1 (2.6%)	2 (5.3%)	
More than one month	191 (62.8%)	70 (23.0%)	25 (8.2%)	18 (5.9%)	
Comorbid condition					$\chi2$=35.189, df=9, p=0.000
1-2 diseases	262 (54.0%)	168 (34.6%)	46 (9.5%)	9 (1.9%)	
3-4 diseases	135 (54.7%)	88 (35.6%)	8 (3.2%)	16 (6.5%)	
5-6 diseases	19 (42.2%)	20 (44.4%)	1 (2.2%)	5 (11.1%)	
7 and more diseases	0 (0.0%)	4 (80.0%)	1 (20.0%)	0 (0.0%)	
BMI					$\chi2$=9.288, df=9, p=0.411
Underweight	8 (53.3%)	6 (40.0%)	1 (6.7%)	0 (0.0%)	
Normal weight	140 (50.0%)	110 (39.3%)	23 (8.2%)	7 (2.5%)	
Overweight	180 (56.2%)	105 (32.8%)	23 (7.2%)	12 (3.8%)	
Obesity	88 (52.7%)	59 (35.3%)	9 (5.4%)	11 (6.6%)	
Length of stay n (%)					$\chi2$=153.815, df=12, p=0.000
Up to 10 days	62 (27.7%)	121 (54.0%)	15 (6.7%)	26 (11.6%)	
10-15 days	122 (50.2%)	99 (40.7%)	20 (8.2%)	2 (0.8%)	
16-20 days	149 (71.3%)	47 (22.5%)	12 (5.7%)	1 (0.5%)	
21-30 days	79 (78.2%)	12 (11.9%)	9 (8.9%)	1 (1.0%)	
31 and more days	4 (80.0%)	1 (20.0%)	0 (0.0%)	0 (0.0%)	

Deterioration of condition mainly was observed at patients with mild (8.8%) and moderate (5.8%) condition. The condition has not changed at 6.7% severe patients. (Table 3).

Delay between the first symptoms and the first present in hospital influenced to outcomes after treatment. 10.5% patients with up to 10 days delay and 8.2% patients with more than one month delay had deterioration of condition. (Table 3)

Presence of seven and more diseases follows to worse outcome after surgical treatment of BPH (20.0%). Condition of 11.1% patients with five-six diseases was not changed after surgical treatment. (Table 3)

According to our study nationality ($\chi2$=12.464, df=6, p=0.052), residency ($\chi2$=2.537, df=3, p=0.469), social position ($\chi2$=20.725, df=15, p=0.146), conservative treatment ($\chi2$=11.907, df=6, p=0.064), BMI ($\chi2$=9.288, df=9, p=0.411) did not influence to outcome after surgical treatment. (Table 3)

Discussion

This study was focused on describing of short outcomes and characteristic of patient of surgical treatment of BPH in

Semey city East Kazakhstan region over a period of three years. This information is needed to define risk group and condition which influence to outcomes of surgical treatment of BPH.

More than 40.0% of all diseases in men over 50 years fall at the share of the BPH that brings this disease into line of primary medical and social problems. Moreover, according toWHO's demographic researches the population of the planet grows old, thus rate of incidence of this pathology is predicted [10] [11]. Clinical manifestations of prostate adenoma occur in 25-35% of men aged 40-50 years, gradually increasing to 75-80% in men over 70 years [12]. According to our investigation a little less than half patients were aged over 70 years old. Commonly aged patients have comorbid conditions it could be explanations for poor outcomes in this age group. We found significant difference between age group and outcomes (χ2=23.518, df=9, p=0.005). We observed deterioration of condition at 31 (9.2%) patients who were over 70 years old and without changes were at 15 (4.5%) patients in same group (Table 3).

As we mentioned before BPH occurs at a high frequency in the aging man and is usually present with one or more comorbidities. Accordingly, the choice of BPH treatment should be guided by the presence of medical conditions such as diabetes, metabolic syndrome, cardiovascular disease, endocrinology disease, and hypertension [13]. We found significant difference between comorbid condition and treatment outcomes (χ2=35.189, df=9, p=0.000). The rate of no changing of condition was higher in patients with five-six comorbid diseases (Table 3).

Race and socioeconomic status are independently associated with BPH. The severity of lower urinary tract symptoms is greater in American black men than American white men [14]. White and African-American men have a similar tendency towards the prevalence of prostate diseases. In fact, several factors contribute to the progression of BPH in African-American people: higher testosterone in the blood, enhanced growth factor, and high sensitivity of androgen receptors [15]. Population of Kazakhstan are represented by Kazakhs that belong to Asian ancestry and Russians that belong to European ancestry, there is few other nationalities which mainly represented by Tatar, Germans, Caucasians nationality. According to our study there was no significant difference between nationalities (χ2=12.464, df=6, p=0.052) and treatment outcomes (Table 3).

Egan K. B. et al. [13] revealed that residency status (rural/urban) was not associated with significantly increased adjusted odds of either recognized or unrecognized lower urinary tract symptoms related to benign prostatic hyperplasia. Kazakhstan is developing country with large area, in some places the distance between regional center and villages can be long. Sometimes specialist is not available in the rural hospital and patients postponing a visit to the doctor to the regional hospital. It could influence to delay of diagnosis and treatment outcome. Our study showed that rural/urban status did not influence to post-operative outcomes (χ2=20.725, df=15, p=0.146) (Table 3).

According to *Fowke et al.* [16] African-American men were significantly less likely to report a prior BPH diagnosis. On the other hand, surgical intervention typically reserved for severe BPH was more common among African-American men. Results of other study (*Seong Ho Lee et al.* 2017) suggest that race and Socioeconomic Status are independently associated with BPH. [14]. According to ourinvestigation there was no significant difference between social position and outcomes after surgical treatment (χ2=20.725, df=15, p=0.146) (Table 3).

It is clear that unplanned emergency way of admission to hospital could influence to outcomes of treatment. Our study found significant difference between way of admission to hospital (χ2=30.658, df=6, p=0.003), by who was sent patient to hospital (χ2=28.690, df=12, p=0.004) and outcomes of surgical treatment (Table 3). We observed recovery rate was better in patients who were admitted to the hospital by planned way than patients who were admitted to the hospital by unplanned emergency way. Deterioration of condition was higher among self-referral patients in compare with patients who were sent by medical specialists or institutions.

Of course severity of condition of patient could influence to post-operative outcomes. We defined significant difference between severity of condition and treatment outcome (χ2=14.087, df=3, p=0.000) (Table 3). It was surprised for us that quantity of patient with deterioration of condition was higher among patients with mild condition. History of conservative treatment did not influence to outcome of treatment (χ2=11.907, df=6, p=0.064) (Table 3).

Delaying intervention can lead to BPH progression and poorer outcomes, particularly on older patients who often have more comorbidity. Older age and larger prostate size, among other factors, are predictive of surgical morbidity and mortality [17], [18]. We revealed significant difference between the time of first symptoms and the first present in hospital and outcomes of treatment (χ2=49.910, df=12, p=0.000) (Table 3). Condition was not change and deteriorated in patients whom delay was more than one month.

Obesity markedly increases the risk of BPH [19]. But our investigation did not reveal any difference between BMI and treatment outcomes (χ2=9.288, df=9, p=0.411). We also found significant difference between length of stay and surgical treatment outcomes (χ2=153.815, df=12, p=0.000). Patients who length of stay in hospital was up to 10 days had bad outcomes, they had high rate of not changing and deteriorated of condition. Patients whose length of hospital stay was 21-30 days had high rate of deteriorated condition (Table 3).

This study has certain benefits and drawbacks, which mostly originate from its retrospective design. Since we had to rely exclusively on the information was received from case reports of all patients, our performance was restrained by the information contained there. Still, we could obtain the data on all patients with BPH who were treated in the Semey Kidney Center during the study period it could potentially overcome the drawbacks listed above.

Conclusion

Aged patients, patients who were admitted to hospital by unplanned emergency way, self-referral patients had worse outcomes after surgery. Delaying intervention can lead to BPH progression and poorer outcomes. Condition

was not changed and deteriorated in patients whom delay was more than one month.

Acknowledgment

The authors would like to thank the administration of Semey Kidney Center, East Kazakhstan region.

Authors' contributions. *Author contribution statement: All authors were equally involved*

Conflict of Interest. *The authors declare that they have no competing interests.*

Funding Source. *The research was funded by the Semey Medical University as part of a doctoral dissertation.*

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