

Urological Pathologies and Their Incidence Rates Determined in Cases Applied to the Health Board

Sağlık Kuruluna Başvuran Olgularda Tespit Edilen Ürolojik Patolojiler ve Sıklıkları

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Abstract

Objective: Applications are made to health boards for age assessment, gender determination, employment in some occupational groups and detection of disability. The aim of our study is to determine the defined urological pathologies and their incidence rates in the patients who applied to the health board of our hospital.

Materials and Methods: Our study included patients who applied to the urology outpatient clinic of the health board between January 2015 and December 2020 for the purpose of employment in some occupational groups, determination of age, gender, disabilities and obtaining a general health report. Patients were investigated in two different groups, according to their indications for their applications as detection of disabilities and other indications, and the diagnoses were classified under the subheadings of stone diseases, malignancies, neurourology-incontinence, andrology and benign prostatic hyperplasia (BPH).

Results: A total of 1453 cases were included in the study. Hundred and fifty-one (10.4%) patients applied for the detection of disability. A total of 206 (17%) patients, including 70 (46.3%) cases in the disability detection group and 136 (10.4%) in the other group had a urological diagnosis. The most common pathology was malignancies with 65 (4.4%) cases, in order of frequency; testicular cancer (n=25: 38.4%), bladder cancer (n=15: 23%), prostate cancer (n=13: 20%), kidney cancer (n=11: 16.9%) and penile cancer (n=1: 1.5%). The second most frequently seen diagnostic group was the stone disease group (n=55: 3.7%), and 17 (30.9%) of them required further investigation after diagnosis. Consequently ESWL (n=6: 10.9%), and surgical intervention (n=4: 7.3%) were planned for the indicated number of patients.

Conclusion: Urogenital system malignancies and urinary tract stones have been identified as the most common pathologies in patients who applied to the health board. The fact that some diseases, especially urolithiasis were followed by further examination and treatment, shows the contribution of the health board examinations to the treatment as well as the health status determination feature.

Keywords: health board, disability evaluation, urologic diseases, medical examination, health check

Öz

Amaç: Yaş ve cinsiyet tespiti, özür tespiti ve bazı meslek gruplarında işe alınma gibi durumlarda sağlık kurullarına başvurular yapılmaktadır. Çalışmamızın amacı hastanemizin sağlık kuruluna başvuran olgularda tanımlanmış ürolojik patolojileri ve sıklıklarını belirlemektir.

Gereçler ve Yöntemler: Çalışmamız Ocak 2015- Aralık 2020 tarihleri arasında, bazı meslek gruplarının işe alınma, yaş ve cinsiyet tayini, özür tespiti ve genel sağlık raporu alınması amacıyla sağlık kurulu üroloji polikliniğine başvuran hastaları içermektedir. Hastalar başvuru nedenlerine göre; özür tespiti için başvuranlar ve diğer nedenlerle başvuranlar olmak üzere iki ayrı grupta incelenmiş ve tanılar; taş hastalıkları, maligniteler, nöroüroloji-inkontinans, androloji ve benign prostat hiperplazisi (BPH) alt başlıklarında sınıflandırılmıştır.

Bulgular: Toplam 1453 olgu çalışmaya dahil edildi. Özür tespiti için başvuran olgu sayısı 151 (%10,4) idi. Özür tespiti grubunda 70 (%46,3), diğer grupta 136 (%10,4) olmak üzere toplam 206 (%17) hastada ürolojik bir tanı mevcuttu. En sık tespit edilen patoloji 65 (%4,4) olgu ile malignitelerdi, sıklık sırasıyla; testis kanseri (n=25: %38,4), mesane kanseri (n=15: %23), prostat kanseri (n=13: %20), böbrek kanseri (n=11: %16,9 ve penil kanser (n=1: %1,5). İkinci en sık görülen tanı grubu 55 (%3,7) hasta ile taş hastalıklarıydı, 17 (%30,9)'sinde tanı konulması sonrası ileri inceleme gerekti, bunun sonucu olarak 6 (%10,9) hastaya ESWL, 4 (%7,3) hastaya cerrahi planlandı.

Sonuç: Ürogenital sistem maligniteleri ve üriner sistem taşları sağlık kuruluna başvuran hastalarda en sık rastlanan patolojiler olarak tespit edilmiştir. Ürolitiazis başta olmak üzere bazı hastalıkların ileri tetkik ve tedavi edilmiş olması, sağlık kurulunun sağlık durumu tespiti özelliğinin yanında tedaviye katkısını da göstermektedir.

Anahtar kelimeler: sağlık kurulu, özür tespiti, ürolojik hastalıklar, tıbbi muayene, sağlık kontrolü

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Introduction

In Turkey, a health board report is issued every day for many patients due to various health problems. In addition to requesting a general health report in cases such as determination of age, and gender, and for employment in some occupational groups, applications to health boards for the determination of disability constitute also an important place among these applications.

The term “disabled” in the legislation; is defined as “the person who has difficulties adapting to social life and meeting his/her daily requirements due to the loss of his/her physical, mental, spiritual, sensory and social abilities to various degrees due to any reason, and needs protection, care, rehabilitation, counseling and support services” [1]. Disability Health Board consists of specialists in internal medicine, ophthalmology, ear-nose-throat diseases, general surgery or orthopedics, neurology or mental health and diseases [2]. The fact that urology is outside of these standard branches is due to the relatively lesser number of applications made regarding urogenital system-related pathologies. However, the branch of urology is included in the evaluation process in the health board in cases of employment for a number of professional groups, age and gender determination and declaration or determination of a urological pathology.

Many studies have been performed in different specialties related to pathologies detected in patients who applied to the health board for detection of disability and for other indications [1,3,4]. However, there is no published article investigating the applications to the health board in the field of urology. The aim of our study is to determine the defined urological pathologies and their incidence rates in patients who applied to our hospital’s medical board.

Materials and Methods

Our study included patients who applied to the urology outpatient clinic of Dr. Sadi Konuk Training and Research Hospital for a health board report between January 2015 and December 2020 for the purpose of employment in some occupational groups (police, security guards, military, etc.), and also for determining the age, gender, and disability status. The ethical approval of the study was obtained from the ethics committee of the same hospital (Dr. Sadi Konuk Training and Research Hospital Ethical Committee approval number: 2021/187). Patients of all age groups were included in the study and their medical files were retrospectively examined. Patients were examined in two different groups, according to the indications for their applications as detection of a disability and for other indications (employment, obtaining a general health report, and determination of age or gender, etc.).

The gender and age of the patients were examined, and their urological diagnoses were scanned mainly through the International Classification of Diseases-10 (ICD-10) codes. Also medical histories, physical examination, and if available, radiological and ultrasonographic findings of the applicants registered in the system were investigated. The diagnoses found were classified under the subheadings of urinary tract stone diseases, malignancies, neurourology-incontinence, andrology and benign prostatic hyperplasia (BPH).

Patients in the group of stone diseases were examined for the need for further examination and intervention. Malignancies were classified as prostate, bladder, renal, testicular and penile cancers. Less frequently encountered pathologies were presented under the heading of “others”; such as renal cysts, testicular and renal agenesis and hypoplasia, ureteropelvic junction (UPJ) obstruction, vesicoureteral reflux (VUR), and urethral stenosis. Urogenital system infections were not included in the study by us because they were not considered as adverse conditions and were recorded at a low rate.

Statistical analysis

Statistical analyses were performed using Microsoft Excel 2013 (Microsoft, Redmond, WA, USA). Continuous data were described as mean and range. Categorical data was described as percentages.

Results

A total of 1484 cases with a health board urology examination record were detected. A total of 1453 cases were included in the study considering the first application records of those who applied more than once. The mean age of the patients was 29.5 ± 7.7 years, male patients constituted the majority ($n=1381$: 95%), and only 72 (5%) female patients included in the study. A total of 151 (10.4%) cases with a mean age of 54.8 ± 9.3 years including 129 (85.5%) male, and 22 (14.5%) female patients applied for the detection of disability. Patients presenting for the determination of disability were older than the general population, as expected. The remaining patients were classified under the heading of “other”.

A total of 206 (14,3%) patients had received a urological diagnosis, including 70 (4,9%) patients in the disability detection and 136 (9,4%) cases in the other group. A urological pathology was identified in almost half of the patients in the disability detection group. The urological pathologies detected as a result of the study and their distribution among the groups are shown in **Table 1**.

The most common pathology was urogenital system malignancies with 65 (4.5%) cases. At least one malignancy had been diagnosed in one-fourth (37/151) of the disabled group. In the other group of admissions, the frequency of malignancy fell to the second rank with 1,9 percent. **Table 2** shows the distribution of detected uro-oncological diagnoses. The most common diagnosis in this group was testicular cancer ($n=25$: 38.4%) including 8 (32%) cases in the disability detection group and 17 (68%) in the other group. The mean age of these patients was 32.3 ± 9.7 years, and the most common pathological subgroup was pure seminoma with a rate of 40 percent. Bladder cancer was the second most common pathology, with a total of 15 (23%) cases including 11 (73.3%) patients in the disability detection group and 4 (26.7%) patients in the other group. The mean age of these patients was 56.2 ± 11 years, and 6 (40%) cases were cystectomized. Prostate cancer was the third most frequently encountered diagnosis with 13 (20%) cases. The mean age of the patients was 57.9 ± 7.5 years. There were 10 (76.9%) patients in the disability detection group and 3 (23.1%) patients in the other group. Five (38.5%)

Table 1. Urological pathologies and their distribution between groups

	Applications for the detection of disability n=151 (10,4 %)	Applications for other indications n=1302 (89.6%)	All applications n=1453 (100%)
Uro-oncological conditions	37 (2.6)	28 (1.9)	65 (4.5)
Urinary system stone disease	4 (0.3)	51 (3.5)	55 (3.8)
Neurourology-incontinence	10 (0.7)	4 (0.3)	14 (1)
BPH	9 (0.6)	4 (0.3)	13 (0.9)
Andrology	0 (0)	10 (0.7)	10 (0.7)
Others	10 (0.7)	39 (2.7)	49 (3.4)
Total diagnosis	70 (4.9)	136 (9.4)	206 (14.3)

BPH: benign prostatic hyperplasia

Table 2. Distribution of urogenital system malignancies

Testicular Cancer	
Number of patients (n;%)	25 (38.4)
Disabled	8 (32)
Other	17 (68)
Age (mean ± SD)	32.3 ± 9.7
Pathological subtypes (n;%)	
Pure Seminoma	10 (40)
Non-seminomatous	2 (8)
Mixed germ cell	11 (44)
Others	2 (8)
Bladder Cancer	
Number of patients (n;%)	15 (23)
Disabled	11 (73.3)
Other	4 (26.7%)
Age (mean ± SD)	56.2 ± 11
Prostate Cancer	
Number of patients (n;%)	13 (20)
Disabled	10 (76.9)
Other	3 (23.1)
Age (mean ± SD)	57.9 ± 7.5
Renal Cancer	
Number of patients (n;%)	11 (16.9)
Disabled	9 (81.8)
Other	2 (18.2)
Age (mean ± SD)	53.5 ± 7.2
Gender (M/F)	8/3
Pathological subtype (n;%)	
Clear cell carcinoma	7 (63.6)
Papillary cell carcinoma	2 (18.2)
Chromophobe cell carcinoma	1 (9.1)
Urothelial carcinoma	1 (9.1)
Penile Cancer (n;%)	
Number of patients (n)	1 (1.5)
Total number of patients (n)	65

Table 3. Distribution of urinary system stone diseases

Disabled	4 (7.3)
Other	51 (92.7)
Age (mean ± SD)	28.5 ± 9.3
Gender (n;%)	
Male	6 (10.9)
Female	49 (89.1)
Patient undergoing further examination (n;%)	17 (30.9)
Conservative follow-up	7 (12.7)
ESWL	6 (10.9)
Surgical intervention	4 (7.3)
Number of patients (n;%)	55

HUN: hydrureteronephrosis; ESWL: extracorporeal shockwave lithotripsy

patients were in the metastatic stage of the disease. Kidney cancer was present in 11 (16.9%) patients including 9 (81.8%) patients in the disability determination group, and 2 (18.2%) cases in the other group. The most common renal pathology was clear cell carcinoma. The mean age of these patients was 53.5 ± 7.2 years, and three (27.2%) of them had metastatic disease at admission. One (1.5%) patient had a diagnosis of penile cancer.

The second most common diagnostic group was stone diseases with 55 (3.7%) patients and when the disability detection group was excluded from the assessments it ranked on top with an incidence rate of 3.9 percent. The mean age of the patients was 28.5 ± 9.3 years, and the majority of them were male patients (n= 49: 89.1%). In 17 (30.9%) of these patients, further examination was required after the diagnosis, and as a result, ESWL was planned for 6 (10.9%) and surgery for 4 (7.3%) patients. The group characteristics of the stone patients are given in **Table 3**.

The neurourology-incontinence diagnosis group ranked third in frequency with 14 (0.9%) cases. The mean age of these patients was 39.7 ± 12.6 years, and 10 (71.4%) patients were receiving treatment with the diagnosis of neurogenic bladder. Almost half of these patients (n=4: 40%) had a traumatic etiology. Thirteen (0.89%) cases with a mean age of 58.3 ± 7.6

years had a diagnosis of BPH. There were 10 (0.68%) patients in the andrology group, and all of these patients had a diagnosis of varicocele. The mean age of the patients was 27.2 ± 7.1 years, and none of them were in the disability detection group.

There were 49 (3.4%) patients in the other group, and the majority of them were (n=23: 46.9%) patients with solitary/single-functioning kidney including 9 (39.1%) patients with renal agenesis, and 7 (34.7%) with renal atrophy/hypoplasia. Seven (30.4%) patients had a solitary kidney due to previous nephrectomy. Patients who underwent nephrectomy with the diagnosis of renal cell carcinoma were included only in the group of ‘malignancies’. The diagnoses determined in the patients applied with other indications are given in **Table 4**.

Table 4. Distribution of diagnoses in the other group

Solitary/Single-functioning kidney number of patients (n;%)	23 (46.9)
Disabled	7 (30.4)
Other	16 (60.6)
Etiologies	
Agenesis	9 (39.1)
Atrophy/Hypoplasia	7 (30.4)
Surgery*	7 (30.4)
UPJ obstruction	7 (14.2)
Renal angiomyolipoma	4 (8.2)
Renal cyst	4 (8.2)
Urethral stenosis	3 (6.1)
Horseshoe kidney	3 (6.1)
Ectopic kidney	2 (4.1)
VUR	2 (4.1)
Testicular agenesis	1 (2)
Prostatic cyst	1 (2)
Bladder diverticulum	1 (2)
Solitary testis**	1 (2)
Total number of patients (n;%)	49

UPJ: ureteropelvic junction VUR: vesicoureteral reflux;
 * nephrectomies performed with benign indications; **
 orchiectomized due to orchitis

Discussion

When we grouped the diagnoses seen in the patients who applied to the health board according to the subspecialty areas of urology, the most common disease group was determined as genitourinary system cancers. A total of 65 uro-oncological pathologies were detected in 63 different cases. In order to determine the prevalence of serious cancer types at a national level in our country, cancer records are collected by the Cancer Control Department of the Ministry of Health, and evaluations are made on the data obtained by considering gender and demographic data of the patients. The data have shown that the incidence of cancer is increasing every year [5]. According to the report of Turkey Cancer Statistics, prostate cancer is the

most common cancer (13%) in men in all age groups in Turkey after lung and respiratory tract cancers. While bladder cancer takes the fourth (8,1%), and kidney tumors the sixth place (2,9%). Testicular cancer is not in the top ten in all age groups. In women, on the other hand, none of the urological cancers are found in the top ten [6].

In our study, testicular cancer patients constituted the majority (39.1%) of the cancer patients who applied to the health board. Although its frequency is low among urological cancers, testicular cancer was the most common urogenital cancer detected in our study which seems to be due to our relatively young patient population. In addition, the conditions that increase the reasons for admission, such as compulsory military service examination of the patients orchiectomized due to testicular tumor seem to increase the number of cases with testicular cancer applying to the disability health board. Testicular cancers account for 1% of all adult malignancies and 5% of urological tumors [7]. The most common cancer in men in the 15-24 age group in Turkey is testicular cancer with a rate of 24.3 percent [6]. The peak incidence is seen in the third decade of life for non-seminomatous and mixed germ cell tumors, and in the fourth decade for pure seminoma [7]. As a result of the sensitivity of testicular cancer to chemotherapy, multidisciplinary approaches, close patient follow-ups, and increased salvage treatment options, long-term survival rates are between 80-90%, even in metastatic disease [8].

The second most common oncological diagnosis in our patient group was bladder cancer. Bladder cancer is the seventh most frequently diagnosed cancer in the male population worldwide and the tenth most common cancer for both sexes. It is approximately four times more common in men than in women [9]. At the time of diagnosis, in one-third of the patients, the disease is limited to the mucosa (Ta, carcinoma in situ) or submucosa (T1) [10]. These patients have much better survival rates than patients with T2-T4 tumors [9]. T stages of the patients were not examined in our study, but it was found that 40% of them were cystectomized. Since it is a surgical procedure that causes organ loss and some degree of disability, this rate is expected to be high. The reason why bladder cancer was found in the second frequency in our study was the applications made for the detection of disability due to this morbid surgical procedure.

Prostate cancer is the second most common cancer in men in Turkey and in the world. It is the most common urogenital cancer [6,11]. In 2012 alone, 1.1 million people were diagnosed with prostate cancer worldwide, which corresponds to 15% of all diagnosed cancers for that year [11]. In Western societies, it is relatively more common, and its frequency is increasing with the widespread use of prostate-specific antigen (PSA) screenings [11]. In an epidemiological study conducted by Zorlu et al., in 2014 covering 12 cities, the incidence of prostate cancer in Turkey was found to be 35/100,000, with the highest rate in Istanbul with 43.7/100,000 and the lowest in Edirne with 17.7/100,000 [12]. It can be thought that prostate cancer was seen less frequently in our study compared to its incidence in the literature, besides its definitive treatment was relatively less morbid with lower incidence of metastatic diseases resulting in decreased need for health board applications. The reason why a

significant portion of the patients (38.7%) who applied had the metastatic disease can be explained by the fact that most of the patients (76.9%) applied for the detection of disability.

Kidney tumors are usually asymptomatic, and their incidence has increased in recent years due to incidental diagnosis with radiological examinations [13]. Renal cell carcinoma represents about 3% of all cancers, with the highest incidence in Western countries. The highest incidence rates in Europe and worldwide are detected in the Czech Republic and Lithuania [14]. It is the most common solid lesion of the kidney and represents 90% of all renal malignancies. As for renal malignancies, men have a 1.5:1 dominance compared to women, and a higher incidence is noted in the elderly population [15]. In our study, a total of 11 cases including 8 (72.7%) male patients had renal tumors, and all but one had renal cell carcinoma. This rate was consistent with the literature.

Urinary system stones were the second most common urological disease group in patients applied to the health board. Although urolithiasis is more frequently seen in some regions, it is a common public health problem all over the world [16]. Its incidence ranges from 1% to 20% depending on the genetic, environmental factors, and dietary habits [17].

In epidemiological studies conducted in our country, prevalence rates of urinary system stones were found to range between 11.1% and 14.8%, and they were seen 1.5 times more frequently in males than in females [18,19]. The lowest, and the highest prevalence rates were observed in The Black Sea (9.5%), and Aegean Regions (12.6%), respectively. In the Marmara Region, its prevalence was found to be 11.4 percent [19]. In our study, the prevalence of stone disease was found to be 3.8%, and almost all these patients were male (89.1%). The reason for the lower incidence of stone disease compared to the literature is that our patient population was mostly asymptomatic, and they applied to the hospital usually for other indications. This fact may explain the low rate of definitive treatment applications (10.9%). In addition, the stone disease was most commonly seen (3.9%) in patients not evaluated in the disability detection group.

It should be noted that one-tenth of these patients who applied for completely different reasons were directed to further treatment with the diagnosis of incidental urinary system stone disease, and surgery was planned for 7.3% of the whole group. This shows us that the health board can also work with a focus on treatment.

The third disease group comprised patients with neurological causes of incontinence, and the majority (71.4%) of this group consisted of patients with a diagnosis of neurogenic bladder. Neurogenic bladder is a lower urinary system disorder secondary to nervous system damage or diseases. Multiple sclerosis, Parkinson's disease, spina bifida, and diabetic neuropathy, and spinal cord injury play a role in its etiopathogenesis [20]. In a study conducted with people with locomotor system disabilities in our country, one of the most common additional pathologies was found to be neurogenic bladder [21]. In our study, the most important etiologic factor was determined as trauma such as falling from a height or traffic accident. Approximately 12,000 new cases are recorded each year in the United States (US) [22]. Some degree of impairment of bladder function has been reported within one year after a traumatic incident in

approximately 81% of these patients [23].

BPH is the most important cause of lower urinary tract symptoms (LUTS) in men. It is the most common benign neoplasia in aging men, with a frequency of 8% in the fourth and 90% in the ninth decade of life [24]. In our country, although there is no direct study to determine the prevalence of BPH, in the study of Uluocak et al., its prevalence rates varied between 4.1% and 34.9% according to different diagnostic criteria of benign prostatic obstruction [25]. In the study of Akı et al., only 14.8% of the cases in all age groups had not LUTS [26]. Although BPH and LUTS do not exactly overlap, they almost always coexist, and it has been reported in previous publications that it may provide insight into the prevalence of BPH [27]. In our study, the prevalence of BPH was 0.89% in the general group, while it was 5.9% in the disability detection group consisting of older patients. These numbers fall far behind the literature data. The biggest reason for this is that BPH is not seen as a disability and is not a remarkable diagnosis in terms of the health board criteria, so it is not recorded and/or questioned.

Another urological diagnosis observed in our study was varicocele (0.68%). Varicocele is the most important, and known cause of male infertility. It is seen in 15-20% of the otherwise healthy male population, and in 25% of men with defective spermatogenesis. This rate rises to 35-40% in men under investigation for infertility [28]. In our study, the diagnosis of varicocele was seen at a low rate not comparable with the literature data. Because the diagnosis of varicocele, just like BPH, is not an important issue in the decision-making in patients applied to the health board.

Half of the patients (46.9%) we examined under the heading of the other group consisted of patients with solitary/single-functioning kidneys, and the percentage of patients nephrectomized due to kidney tumors was not included in this estimation. The causes of the solitary kidney are usually unilateral renal agenesis, congenital hypoplasia/dysgenesis and surgeries. The prevalence of renal agenesis is 3.3 per 10,000 live births [29]. In our patient group, renal agenesis seems to be the most important cause of solitary kidney with 39.1 percent. However, when patients nephrectomized due to kidney tumors were added to this group, surgery seemed to be the most important etiologic factor.

The most important limitation of our study is that due to the diagnostic selectivity of the health board, some diagnoses were identified less than they actually are. For example, urological pathologies such as varicocele, BPH or kidney cyst, which are frequently seen in the community, are not important in the assessments of the health board, do not constitute a disability or defect, therefore they are not questioned and recorded.

Conclusion

Urogenital system malignancies and urinary system stones have been identified as the most common pathologies in patients applied to the health board. Although our patient population does not directly reflect the condition in Turkey in general, it may be a benchmark for larger-scale studies.

In addition, the fact that some diseases, especially urolithiasis which were diagnosed incidentally in the examinations made

for the determination of health status, with further examination and treatment shows the contribution of the health board examinations to the treatment as well as determination of the health status.

Ethics Committee Approval: The study was approved by University of Health Sciences, Dr. Sadi Konuk Training and Research Hospital Ethical Committee, Bakirkoy, Istanbul, Turkey (Approval No: 2021/187).

Informed Consent: An informed consent was obtained from all the patients for research.

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