

Kamiński Piotr, Jankowska Paula, Jankowski Krzysztof, Nogalski Adam, Ciechan Janusz. Epidemiology of urogenital injuries in the Regional Specialist Hospital in Puławy in years 2007 -2018. Journal of Education, Health and Sport. 2019;9(8):611-616. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.3383223>  
<http://ojs.ukw.edu.pl/index.php/johs/article/view/7359>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part B item 1223 (26/01/2017).  
1223 Journal of Education, Health and Sport eISSN 2391-8306 7

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The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 05.08.2019. Revised: 15.08.2019. Accepted: 01.09.2019.

## **Epidemiology of urogenital injuries in the Regional Specialist Hospital in Puławy in years 2007 -2018**

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### **ABSTRACT**

#### **Introduction**

Trauma is defined as damage to cells, tissues and organs caused by external factors acting on them. According to WHO data, trauma caused 4.8 millions of deaths in 2016. Urogenital trauma occurs in 10% of all the injuries in the human population.

#### **Aim of the study**

The aim of this study was to characterize the patients treated for injuries in Urology Department in Regional Hospital in Poland and compare the results with the data from literature.

#### **Material and methods**

The study involved patients hospitalized in Regional Specialist Hospital in Puławy, Poland from 2007 to 2018. The survey was based at analysis of medical documentation. The collected

data has been subjected to statistical analysis. 66 patients were included in the study group. Their average age was 43.25 years.

#### Results

The absolute majority of patients were men – 81.81% (n=54), women – 18.18% (n=12). The average age for males was 42.27 and for the females – 44.25. Most frequent trauma in our study was the renal trauma 36.36% (n=24). 47.06% of this injuries were associated with MVA's. The second most frequent group was a genital trauma - 21 patients (31,81%). 81.81 % of them required surgical treatment. Another group constituted 10.6 % (n=7) were the patients treated for bladder injury. Penis was injured in 6.06% (n=4), 75% of patients required a surgery. Urether has been injured only in 4.55%.

#### Conclusions

Kidney is the most frequent organ of genitourinary tract, affected by trauma, particularly during MVA's. Victims are usually treated conservatively. External genitalia injuries, especially male, are also very frequent. Mostly patients need a rapid surgical intervention but appropriate treatment allows the patient to recover completely without any lasting disability

Key words: Abdominal Injuries, Urinary Tract, Urologic Surgical Procedures

#### Introduction

Injuries are a significant health problem for societies around the world. According to the WHO data (2016) they caused about 4.8 million of deaths, which is approximately 8,5% estimated number of deaths in the entire human population. It is noteworthy that the highest mortality rate is noticed among men between 15 and 49 years old. The most common reason of injuries are motor vehicle accidents (MVA's), which are also the 8th reason of total deaths in entire population. Self-mutilation, violence and falls are also frequent causes of trauma [1].Urogenital trauma constitute approximately 10% of all injuries [2,3,4]. They rarely belong to life-threatening injuries but they could provide to long-term consequences, like sexual dysfunction or disorders of the urinary tract. Proper and appropriate fast diagnosis and treatment is very important for long-term outcomes. There is a need for a constant analysis of epidemiology of genitourinary tract injuries, which could be different in particular regions.

#### Aim of the study

The aim of this study was to identify frequency, types and treatment outcomes of patients treated in Department of Urology and Urological Oncology in Regional Specialist Hospital in Puławy, Poland.

#### Material and method

All hospitalizations in the Department of Urology and Urological Oncology of SPZOZ Puławy in the years 2007-2018 were reviewed retrospectively. Study was based on analysis of medical documentation. Regional Specialist Hospital in Puławy is a hospital, that provides healthcare for 114 198 inhabitants [5]. In our department there is approximately 1600 hospitalization per year. Among all patients treated in years 2007-2018 authors identified these, who were treated for injuries defined by basic disease or co-morbid disease code from S to T according to ICD-10 classification. From this group authors have excluded 6 patients with basic disease code form S to T but with injuries concerning other organ, not from a genitourinary tract. A group of 66 patients was created.

#### Results

Among 66 patients vast majority constituted men (n=54, 81,81%). The women group was less numerous (n=12, 18,18%). The average age of all patients was 43,25; in men 42,77, in women 44,25 years.

62.12% of patients required surgical intervention (n = 41); 4 patients had injuries involving more than one area of the body.

In the analyzed group there were mainly inhabitants of the Lublin province (n = 61, 92.42%), except that the patients were also residents of the Mazowieckie voivodship (n = 5, 7.57%). The average time of the patient's stay in the Unit was 7 days. The structure of injured organs is shown in Fig. 2.

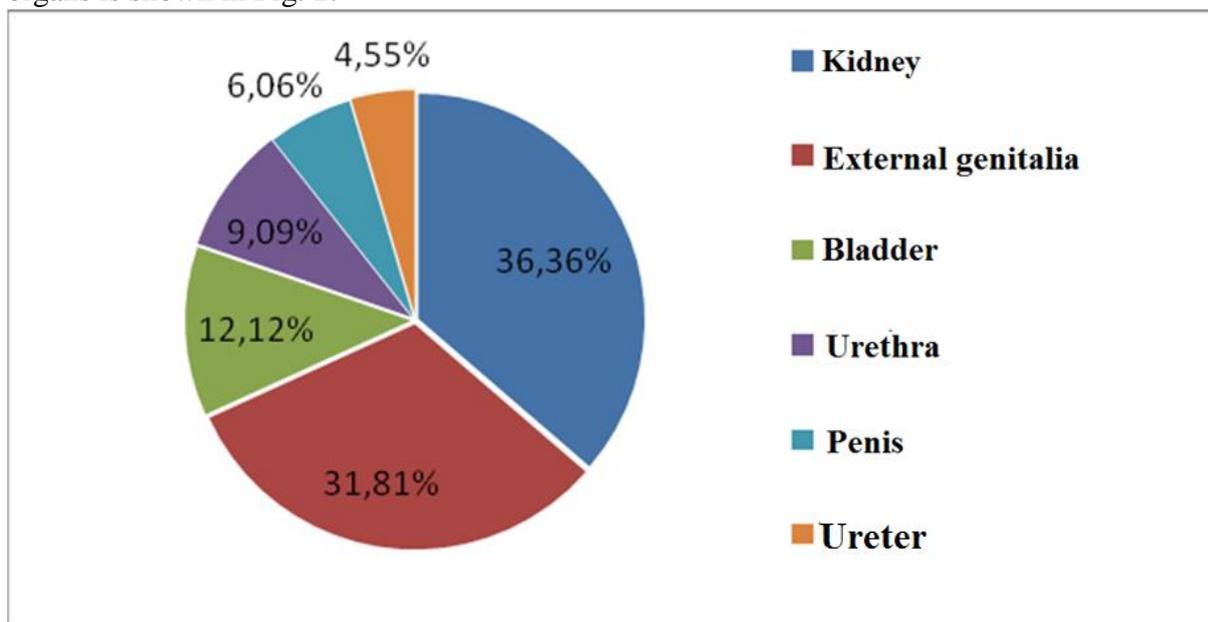


Fig.2 Injuries of genitourinary tract.

Kidney injuries in the number of 24 concerned 36,36% of all hospitalizations. Vast majority of patients were men (n=20, 83,33%). The average age of patients was 41,83. 25% of them required a surgical treatment. In table 1. the most common mechanisms of kidney injury identified in the study group are shown.

| Reason                                    | %      |
|---|--------|
| <b>1.MVA's</b>                            | 47,06% |
| a) Drivers and passengers                 | 23,53% |
| b) Pedestrians                            | 11,76% |
| c) Cyclists                               | 11,76% |
| <b>2. Accidents at work</b>               | 35,29% |
| a) Fall from a ladder                     | 23,53% |
| b) <b>Contact with tools and machines</b> | 11,76% |
| <b>3. Others</b>                          | 17,64% |

Tab.1 Mechanisms of kidney injuries.

In years 2007-2018 only 3 patients were treated because of urethral injury(4,55%) in Department of Urology in Puławy Hospital. They were all women. The average age was 57,67. Each case required a surgery.

Bladder was the third most frequently injured organ of urogenital tract in our study. 7 patients (10,6%) were hospitalized with this type of trauma. Most of them were women (57,14%). 4 patients required surgical intervention (n=4, 66,66%), 3 of them was treated conservative. The most common procedure was a cystoscopy and removal of foreign body.

Hospitalizations due to urethral injury constituted 9.09% (n = 6) of the whole group. They concerned only men with the average age 53,67. 4 patients was treated by suprapubic cystostomy, 2 of them were being observed.

In our study, the second most frequent injury is a external genitalia trauma. What is important, the average age was 35,76. During the analyzed period, 21 patients were treated with this kind of injury, all of them were a men. The most common ICD-10 code was S30.2 - Contusion of

external genitalia organs. Table 2. presents other ICD-10 codes diagnosed in this group. Approximately 81% of them required a surgical treatment.

| <b>ICD-10 DiagnosisCode</b>  | <b>n</b> | <b>%</b> |
|--|----------|----------|
| S30.2 Contusion of external genitalia organs                                       | 16       | 72,72    |
| S31.3 3 Open wound of scrotum and testes   | 3        | 13,64    |
| S38.0 Crushing injury of external genitalia organs                                 | 2        | 9,09     |
| S39.8 Other specified injuries of abdomen, lower bac, pelvis and external genitals | 1        | 4,54     |

In our study, penis trauma occurred in 4 patients (6,06%) The average age was 37,5; 75% of them required a surgical intervention.

#### Discussion

The results of our study are quite similar to the results known from the other papers. Men underwent injuries 4.5 times more often than women, which is a slightly higher ratio than described in other studies. The average age was 43,25. What is important, patients aged 15-30 were 34,85% of the whole group, staying in line with data collected in other scientific papers on similar topics [6,8]. The percentage of patients treated by surgery was 57,58%. It is surprising that only 4 patients (6.06%) suffered an injuries associated with more than one region of a body. According to the authors, this is due to the specificity of the institution, which is not a trauma center, so multiple body injuries are directed to the nearby Trauma Center in SPSK-4 in Lublin.

The most frequently injured organ of genitourinary tract is a kidney. In the literature, this type of injury is estimated at 1.2-3.3% of all injuries [9-10]. Typical mechanism is a blunt trauma of lower abdomen [7], penetrating trauma (gunshots, stab wounds etc.) and iatrogenic injuries are not so frequent [4]. Kidney trauma is often associated with MVA's, involving both pedestrian and the car users. In our study renal trauma was the most common type of injury, concerning 1/3 of all cases. Vast majority of the patients were men (83.33%), with the average age 41,83. All of the injuries were caused by blunt trauma with contusion of the kidney as a typical kind of a injury. According to ICD-10 classification, 47.06% of injuries happened during the MVA's, mostly among the passengers or drivers of a car (23.53%) and pedestrians (11.76%) and cyclists (11.76%). Otherwise, falls from a ladder and injuries during contact with machines as an example of accidents at work were also quite frequent (35.29%). 25% of renal injuries were treated by a surgery, typical procedure was a drainage of hematoma. Only 1 patient required a nephrectomy.

Bladder trauma is associated with high energy injuries of lower abdomen, being mainly related with pelvis fracture. According to the literature, 60-90% of bladder injuries are connected with pelvis fracture but in turn, in 5.7% of pelvis fracture is connected with bladder trauma. Bladder injuries occur in 1.6% of blunt abdominal injuries [14]. Non-iatrogenic injuries are mostly caused by MVA's and falls, iatrogenic ones are formed usually during gynecological-obstetrics procedures. In this study bladder trauma were found in 12.12%. The most frequent diagnosis was a foreign body but 2 cases were caused by fracture of a pubic bone. Statics of a mechanism were incomplete.

Urethral trauma occurs in 4% of all urogenital injuries[15]. Approximately 5 times more often urethral injuries affect men, what is obviously related with the anatomic structure and lower mobility of a male urethra than female [4]. Injuries of a urethra could be divided into posterior and anterior. The most popular mechanism is iatrogenic, particularly during foley catheter placement, urological procedures. Non-iatrogenic injuries are caused by blunt trauma

(anterior urethra) and pelvis fractures (posterior urethra) [4]. In our study this type of urogenital trauma was found in 9.09% of all diagnosed injuries. This is over 2-times more often than delineated by other authors. We did not collect any information about the mechanism. All of the patients were men, 2/3 of them required a surgical procedure – suprapubic cystostomy.

Due to anatomical structure and external exposition, male genitalia are injured quite often but there is no life-threatening condition. They can lead to lasting structural defects and deterioration of the quality of life [16]. According to other studies, external genitalia trauma (penis, testes and scrotum) occurred in 27.8% to 68.1% of whole group patients [2]. Blunt trauma [3,17], especially during MVA's and physical activity is the most common mechanism. Approximately 20% of injuries are penetrating, mostly caused by gunshots or bites. Accidents with penis trauma occurs in 10-15% of all genitourinary injuries. In this study external genitalia trauma is estimated on 29.17% what place that on second most frequent type of an injury. This is consistent with the data from the analyzed papers [2,8]. Surgical treatment consist in most cases on scrotal revision and suturing of the testes and damaged tissues. In 3 cases partial or total orchidectomy or epididymectomy was performed. Penile trauma occurred in 6.06 % and 3/4 of patients was sustained to the surgery.

#### Conclusions

Kidney is the most frequent organ of genitourinary tract, affected by trauma, particularly during MVA's. Victims are usually treated conservatively. External genitalia injuries, especially male, are also very frequent. Most patients need a rapid surgical intervention but appropriate treatment allows the patient to recover completely without any lasting disability.

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