ANNA GAŁECKA[1], MICHAŁ EKKERT[2], EWA NOWAKOWSKA-ZAJDEL[3], ANDRZEJ KOZOWICZ[3], MAŁGORZATA MUC-WIERZGOŃ[3],TERESA KOKOT[3]

Pilne interwencje nefrologiczne – najczęstsze przyczyny hospitalizacji pacjentów

Streszczenie

Wstęp. Choroby nerek stanowią istotny problem medyczny i społeczny. Współczesna medycyna poczyniła ogromny postęp w procesie diagnostyki i terapii tych schorzeń. Jednak kluczową kwestią wciąż pozostaje skuteczna profilaktyka i jak najszybsza pomoc medyczna w przypadkach wymagających pilnej interwencji nefrologicznej.

Cel. Celem pracy była ocena przyczyn nagłych przyjęć pacjentów ze schorzeniami nerek i określenie skali zjawiska pilnych interwencji w oddziale nefrologicznym.

Materiał i metody. Badania przeprowadzono w oparciu o analizę retrospektywnej grupy 3334 pacjentów SPSK Nr 1 w Zabrzu, którzy zgłosili się na ostry dyżur nefrologiczny w latach 2005-2010. Badaniem zostali objęci dorośli, z dolegliwościami nefrologicznymi, dializowani jak i leczeni zachowawczo. Wskazania do przyjęć ujęto w 14 kategoriach.

Wyniki. Około 50% przyjętych do Oddziału Nefrologicznego stanowią pacjenci obu płci, w przedziale wiekowym od 18-93 roku życia (średnia wieku – 56 lat). Wśród najczęstszych przyczyn nagłych interwencji odnotowano w 18,3% stan kwalifikujący do leczenia nerkozastępczego. Pacjenci z dolegliwościami ogólnoustrojowymi w przebiegu chorób nerek stanowili 14,2%, z dysfunkcją cewnika do hemodializy – 12,8%, z dializacyjnym zapaleniem otrzewnej – 11,8%. Chorzy leczeni metodą dializy otrzewnowej, u których wystąpiły dodatkowo patologiczne objawy ze strony innych układów to 11,1% a hemodializowani z podobnymi dolegliwościami – 14,7%. Przyjęci z ostrą niewydolnością nerek stanowili 4,3%, z infekcjami dróg moczowych – 2,8% ogółu przyjętych w ramach ostrego dyżuru. Inne rzadkie przypadki przyjęć stanowią łącznie ok.10%.

Wnioski. 1. Liczba pilnych interwencji nefrologicznych wynosi około 50% w stosunku do ogólnej liczby leczonych i nie wykazuje tendencji spadkowej. 2. Liczba mężczyzn hospitalizowanych ze wskazań życiowych jest wyższa od liczby kobiet. Objawy sepsy u mężczyzn, a infekcje dróg moczowych wśród kobiet były najczęstszymi przyczynami hospitalizacji. 3. Stany kwallifikujące chorych do leczenia nerkozastępczego stanowiły największy odsetek przyczyn hospitalizacji.

Słowa kluczowe: nagłe stany nefrologiczne, interwencje nefrologiczne, analiza przyjęć.

Emergency nephrological interventions – most frequent reasons for inpatient treatment

Abstract

Introduction. Kidney diseases represent a significant medical and social issue. Modern medicine has made immense progress in the process of diagnostics and treatment of the said diseases. However, the effective prophylactics and possibly the promptest medical assistance in cases demanding emergency nephrological intervention remain the key questions here.

Aim. The purpose of this paper was to assess the reasons for emergency admissions of patients with kidney diseases to hospital and determine the scale of emergency interventions at the nephrological department.

Material and methods. The research was carried out based on the analysis of a retrospective group of 3334 patients of Independent Public University Hospital No 1 in Zabrze, who checked in the nephrology emergency room throughout the years 2005-2010. The research included adults with nephrological ailments, both dialyzed and non-invasively treated. The admission indications were presented in 14 categories.

Results. Approximately 50% of patients admitted to the Nephrological Department were of both sexes, in the 18-93 age group (average age – 56). The most frquent reason for emergency interventions was the condition qualifying for renal replacement therapy (18.3%). Patients with systemic ailments accompanying renal diseases constituted 14.2%, 12.8% patients had hemodialysis catheter dysfunction, 11.8% – patients with dialysis related acute peritonitis; 11.1% – were hemodialyzed patients with pathological symptoms of other systems; 14.7% – were hemodialized patients with similar ailments. Patients admitted with acute renal failure accounted for 4.3%, while 2.8% of all the patients admitted to the emergency room had urinary tract infections. Other rare cases in the patients admitted represent ca. 10%.

Conclusions. 1. The number of emergency nephrological interventions was ca. 50% compared to the total number of patients and no declining tendency has been observed. 2. The number of male patients hospitalized for lifesaving reasons exceeded the number of female patients. The most frequent causes for hospitalization were sepsis symptoms in male patients and urinary tract infections in female patients. 3. The highest rate of causes demanding emergency nephrological assistance includes qualifications for renal replacement therapy.

Keywords: emergency nephrological conditions, nephrological interventions, admissions analysis.

[1] Nephrological Department with Dialysis Treatment Ward, Prof. Szyszko Independent Public University Hospital No 1 in Zabrze, Medical University of Silesia in Katowice, Poland
[2] Knurów Municipal Hospital Ltd., Knurów, Poland
[3] Department of Internal Medicine, Medical University of Silesia, Katowice, Poland

List of abbreviations:

CAPD – Continuous Ambulatory Peritoneal Dialysis
APD – Automatic Peritoneal Dialysis
HD – Hemodialysis
CKD – Chronic Kidney Disease
AKD – Acute Kidney Disease

INTRODUCTION

The development of medicine, including progress in nephrology, has contributed to the improvement of treatment effects in patients with kidney diseases, which is actually not only translated into extension of lifetime, but also into the formation of their better life quality. Nephrological patients are specially the ones struggling with numerous coexistent ailments of various organs, who require professional diagnostics and therapy and thorough psychological and social care. The therapeutic process includes patients at the initial and chronic stage of the disease, with terminal renal failure, dialyzed patients, patients under immunosuppressive therapy as well as those who require prompt intervention, in emergency condition, directly threatening their lives and health. Nephrological interventions have various causes and generate appropriate therapeutic decisions. The patients who require emergency intervention represent an important issue throughout the therapy and nursing process. Correct aid in emergency states is one of the basic tasks of hospitals all over Poland. The procedures require appropriate funds, work organization in the particular unit, equipment, qualified staff, but also coordinated measures of all the entities of the provincial level. The knowledge of the locations that may need specialist assistance and the mode they can obtain it, are also important.

AIM

The purpose of the paper was to assess the causes of emergency admissions of patients with kidney diseases and determination of the emergency interventions scale at the nephrological department throughout the years 2005-2010.

MATERIAL AND METHODS

Retrospective analysis was carried out on the group of 3334 patients of Independent Public University Hospital No 1 in Zabrze (SPSK No 1 in Zabrze), who checked in Nephrological Emergency Room throughout the years 2005-2010. Male and female patients of the age group 18-93, with nephrological ailments, both chronically sick, hemodialyzed, peritoneally dialyzed as well as non-invasively treated patients were examined. There were hospitalized 701 females and 880 males. The average age of the examined patients was 56 (Table 1).

The nephrological department had the Emergency Room available every day throughout the period analyzed. The most frequent causes of the patients' emergency cases were settled, based on the documentation available. The findings were systematized in 14 categories in order to reflect the scale of the issue in the particular years (Table 2).

The analysis of results was carried out by means of Microsoft Office, Excel Windows and Statistica.

The tests guarantee the anonymity of the results obtained.

RESULTS

Throughout the years 2005-2010 the analyzed 3334 people were provided with first aid. They were of 18-93 age group, more frequently males – 880 people. The group of females amounted to 701. The age of females hospitalized ranged between 18-93 and males –18-90.

In 2005 the total number of delivered emergency interventions is the highest in relation to other periods, i.e. 313, of which 198 cases concern males and 115 – females. Five hundred forty-nine patients demanded emergency physician's assistance in 2005, i.e. 57.0% of all the patients treated at the department.

Two hundred ninety-one patients demanded emergency nephrological interventions in 2006, i.e. 47,6% in comparison to the total number of patients treated in this period with males (169) predominating females (122).

Subsequently 261 patients required emergency nephrological intervention in 2007, which represented 50.5 of all the patients hospitalized (again more frequently in males (137) than in females (124).

The rate of patients requiring emergency nephrological intervention in 2008 is comparable to 2006 and is 47.6% in relation to the total number of patients treated in the same period in 2008.

The year 2009 saw the lowest index of emergency nephrological interventions in the years analyzed, i.e. 38.5%. The total number of patients was 574. Like in all the previous years, the number of hospitalized males exceeded that of females.

TABLE 1. Emergency nephrological interventions throughout the years 2005-2010.

Years analyzed	Females hospitalized	Age range of females hospitalized	Males hospitalized	Age range of males hospitalized	Patients who required emergency nephrological intervention	Total number of patients treated at the Nephrological Department	% of patients who required emergency nephrological intervention
2005	115	21-86	198	20-85	313	549	57.0%
2006	122	18-87	169	24-81	291	611	47.6%
2007	124	33-93	137	23-87	261	517	50.5%
2008	140	23-88	144	18-88	284	597	47.6%
2009	102	23-85	119	21-89	221	574	38.5%
2010	98	19-91	113	19-90	211	486	43.4%
Total	701	18-93	880	18-90	1581	3334	47.4%

TABLE 2. Nephrological causes for patient admissions throughout the years 2005-2010.

Causes of emergency nephrological interventions	Total patients admitted in 2005-2010	Females	Males	% patients admitted in 2005-2010
Acute renal failure	68	35	33	4.3%
Bleeding around the hemodialysis catheter	25	11	14	1.6%
HD catheter dysfunction	203	102	101	12.8%
Arteriovenous fistula dysfunction	32	16	16	2.0%
Bleeding from arteriovenous fistula	17	11	6	1.1%
Dialysis related acute peritonitis. APD and APD treated	186	72	114	11.8%
Hemodialysed with pathological symptoms from cardiovascular, respiratory, alimentary, nervous system, with water-electrolytic balance disorders, dermatological lesions	233	93	140	14.7%
CAPD and APD treated with pathological symptoms from cardiovascular, respiratory, alimentary, nervous system, with water-electrolytic balance disorders, dermatological lesions	175	74	101	11.1%
Qualification for renal replacement therapy (CAPD, APD, HD) (deterioration of examination results)	289	119	170	18.3%
Patients with sepsis symptoms	19	7	12	1.2%
Infection of HD, CAPD or arteriovenous fistula	22	10	12	1.4%
Urinary tract infections	45	27	18	2.8%
Exacerbation of renal inflammatory process	43	23	20	2.7%
Other cases including: abdominal pain, anuria, ascites, fever, convulsions, hematomas, stenocardial (chest) pains, hypertensive crisis, symptoms of chronic renal failure (insufficiency)	224	101	123	14.2%
Total	1581	701	880	100%

In 2010 the number of patients hospitalized was the lowest (486) of the years analyzed and represented 43.4% in relation to the total number of patients treated that year.

The rate of emergency nephrological interventions among the patients hospitalized throughout the years 2005-2010 in relation to the total number of patients treated in the said period ranged between 38.5 and 57 % and did not show any distinct decreasing tendency (Table 3).

TABLE 3. Emergency interventions at the Nephrological Department 2005-2010.

Years analyzed – number of patients	2005	2006	2007	2008	2009	2010
Acute renal failure	18	12	8	10	7	13
Bleeding around the hemodialysis catheter	10	4	4	3	1	3
HD catheter dysfunction	36	42	39	37	31	18
Arteriovenous fistula dysfunction	7	5	9	6	1	4
Bleeding from arteriovenous fistula	2	6	3	4	0	2
Dialysis related acute peritonitis.	37	33	27	31	36	22
Hemodialyzed patients with pathological symptoms	41	45	39	35	39	34
CAPD and APD treated with pathological symptoms	33	34	45	24	29	10
Qualification for renal replacement therapy	58	48	34	50	68	31
Patients with sepsis symptoms	2	2	2	2	3	8
Infection of HD, CAPD or arteriovenous fistula	5	2	5	6	0	4
Urinary tract infections	10	6	3	11	2	13
Exacerbation of renal inflammatory process	7	3	9	10	0	14
Other patients	47	49	34	55	4	35

The most frequent cause of nephrology department patients' emergency hospitalization was exacerbation of the clinical condition or abnormal laboratory test results of long-term treated patients and the patients whose condition required qualification for immediate renal replacement program. The persons represented 18.3% of emergency admissions. A serious problem were patients chronically dialyzed, most often checking in with severe condition, cardiovascular, respiratory, alimentary, nervous system ailments, water-electrolytic balance disorders or dermatological lesions. The rate of such patients was 14.7%. Patients with other symptoms, such as abdominal pain, anuria, stenocardial ailments, hypertensive crisis, symptoms of chronic renal failure represented 14.2% of indications recorded for emergency admission. Large number of emergency nephrological interventions was the dysfunction of catheter applied for hemodialysis (HD) – it applies both to temporary and permanent catheters. The patients with hemodialysis catheter dysfunction represented 12.8% or with arteriovenous fistula were 2.0% of interventions reported in 2005-2010. Bleeding from the area of insertion of hemodialysis catheter (1.6%) frequently complicates efficient dialysis cycle procedure. The lowest rate of emergency checks-in was bleeding from the arteriovenous fistula (1.1%). In this case the number of females was almost twice as high as that of males. .

The infections of hemodialysis catheter area, peritoneal dialysis catheter area or arteriovenous fistula represent 1.4%. A frequent complication in patients dialyzed with the continuous ambulatory peritoneal dialysis (CAPD) or automatic peritoneal dialysis (APD) was peritonitis – 11.8%, with accompanying symptoms, such as: abdominal pain, cloudy dialysis fluid appearing during emissary from the peritoneal cavity, raised body temperature, stomach upset, laboratory confirmed high pleocytosis. The CAPD and APD treated

patients checked in called for assistance also with other symptoms from alimentary, cardiovascular, respiratory, nervous systems, water-mineral balance disorders or skin ailments. All such cases represented 11.1% of emergency interventions. The number of check-ins due to acute renal failure was 4.3%. Urinary tract infection was the reason for 2.8% admissions, frequently coexisting with other ailments. The number of females with recurrent urinary tract infection exceeded that of males. The exacerbation of chronic renal inflammatory process constitutes 2.7% of emergency cases in 2005-2010. Sepsis was recorded in 1.2% emergency check-ins in the period analyzed (twice as much more frequently diagnosed in males than the rate in females).

DISCUSSION

Kidney diseases and their complications represent a significant issue. In addition to such civilization diseases as cardiovascular ailments, diabetes, neoplasms, obesity, they are subject to numerous observations and research [1,2]. Acute kidney injury is one of several conditions related to the disorders of renal structure and function [2] and includes acute renal failure, but is a wider notion.

The assessment of emergency medical incidents, including emergency nephrological intervention, requires particular examination. Based on the inpatient treatment analysis throughout the years 2005-2010 at SPSK No 1 in Zabrze, the highest rate were patients qualified for immediate inclusion in the renal replacement therapy program (18.3%).

Within present practice, the decision on starting such therapy in patients with acute renal failure is more often based on the presence of clinical symptoms of water intoxication and indicators of disturbed biochemical balance (azotemia, hyperkalemia, severe acidosis). Such situation may be the result of the fact that numerous patients check in with a specialist in an advanced stage of the disease, when the qualification for dialysis therapy becomes an absolute necessity [3]. Hemolysis is the dominating method of renal replacement therapy in Poland. More than 130 people in a million of population start renal replacement therapy every year [2,4]. It is assessed that more than a dozen per cent population in Poland – ca. 4 million – suffer with various stages of renal failure. The number of patients requiring dialysis permanently grows – it was ca. 20 thousand in 2005, while it exceeded 17 thousand in 2010. Hemodialysis is a dominating renal replacement therapy and represents 90% of all the procedures [5] and, as a life-saving procedure, is refunded by NFZ (National Health Fund). Out of dialyzed patients, the number of those with diabetic nephropathy and hypertensive nephropathy [3,6] has been growing, and affects people over 65 years old. More than half of them are people over the age of 65 and 20% – people over 75 years old. The practice to date and examinations [7-10] indicate that a number of worrying ailments of cardiovascular respiratory systems, water-mineral balance disorders or skin ailments has been often been observed in the dialyzed patients. The said disorders frequently represent threats to the patient's life and complicate the history of dialysis. Most of the patients perform hemodialysis by means of hemodialysis catheter that in practice might dysfunction (12.8% in the material analyzed). The catheters applied wear out or are damaged for various reasons, because of exploitation. Catheter occlusion may occur due to increased blood clotting or improper care, impeding the performance of full dialysis. Long-term maintenance of catheter function is provided by: correct insertion and use, thorough care, correct diagnosing and treatment of catheter area complications [2,11,12]. Bleeding from the hemodialysis catheter insertion area was observed in 1.6% patients examined. Infections of the hemodialysis catheter area, peritoneal dialysis or arteriovenous fistula were in (1.4%), and bleeding from the arteriovenous fistula represented just 1.1% cases.

Apparently, hemodialysis as a renal replacement treatment method just helps to compensate the basic homeostasis disorders and does not liquidate the effects of chronic renal failure [2]. Therefore, each hemodialyzed patient should be considered a potential recipient of kidney transplant [6,13,14]. Acute renal failure occurs as a complication in 5% patients hospitalized at the cardiologic departments and concerns ca. 30% of patients treated at emergency wards. More and more patients of old age are recorded in this group [7]. Since mid-1990s a decreasing tendency of patients with acute renal failure of dialyzed kidneys, the issue mainly concerns males and starts at a late period of the disease [8]. Patients with dialysis related peritonitis often encountered in daily practice upon own examinations represented 11.8% of all the patients. Urinary tract infections as the causes of emergency interventions represented 2.8% of all the cases in the material analyzed and concerned females in particular. Similar data is stated in other works [10]. The morbidity rate of urinary tract infections after 65 years of age is significantly higher in females than in males. The urinary tract infections occur in ca. 20-50% sexually active women, at least once in a year [6].

The number of emergency interventions due to urinary tract infections, throughout the years examined is on a constant level (2.8 % in the period analyzed). In spite of significant progress in the scope of pathogenesis, the mortality among the patients is very high and reaches 50%, while in case of sepsis, the mortality in patients with acute renal failure reaches even 80% [8]. Other analyzed check-ins (14.2%), such as: fever, abdominal pain, stenocardial pains, anuria, etc, required integrated approach and emergency aid to the nephrologically sick patient.

A significant element affecting the health condition of patients with chronic kidney disease or after kidney transplantation is their life quality. The life quality examination results are related to the chronically dialyzed patients indicate that the factors responsible for lower life quality assessment are also accompanying diseases or symptoms occurring as a complication of the primary disease [15,16].

Throughout the last decades, a dramatic development of dialysis therapy has taken place. It mainly concerns the production of state-of-the-art dialysis membranes, water and dialysis fluid treatment systems, fully automatic, multifunctional artificial kidney machines. It was followed by modern dialysis techniques. Numerous clinical tests enabled the settlement of optimum dialysis dose (depending, without limitation, on the procedure time, dialyzer type), conditioning the best well-being of the patients and possibly

the longest survival. In spite of the said improvements, hemodialysis remains a very non-physiological method of treatment, because the patients have immense concentration fluctuations of uremic toxins and ions in humoral fluids and blood volume variations in the blood vessels. This is the cause of bad feeling of patients and numerous side-symptoms. Appropriate conservative treatment and disciplined observance of indications compliant with the individual scheme prepared for the particular patient is indicated in order to reduce the said effects.

CONCLUSIONS

1. Renal replacement therapy, including hemodialysis is a dominating method of renal failure treatment. Acute renal failure is one of the significant issues in nephrology, also including the period examined.
2. Throughout the years examined, 2005-2010, the number of nephrological interventions is about 50% in relation to the total number of patients and represents no decreasing tendency throughout the years analyzed.
3. The number of males hospitalized due to life-saving indications exceeds that of females. Symptoms of sepsis were more often observed in males, while urinary tract infections – in females.
4. The most frequent causes requiring emergency nephrological assistance include conditions qualifying the patients for renal replacement therapy, patients chronically hemodialyzed, patients with unwanted ailments from other systems, included in repeatable dialysis scheme, patients with systemic ailments accompanying renal diseases, patients with hemodialysis catheter dysfunction and dialysis related peritonitis.

REFERENCES

1. Penar J, Klinger M. Zapalenie otrzewnej – kiedy leczenie chirurgiczne? Nefrol Dial Pol. 2010;14(4):218-9.
2. Szczeklik A. Choroby wewnętrzne. Stan wiedzy na rok 2011. Kraków: Med Prakt; 2011. p. 1329-465.
3. Więcek A, Kokot F. Postępy w nefrologii i nadciśnieniu tętniczym. Kraków: Med Prakt; 2009. p. 1-156.
4. Rutkowski B. Dializoterapia. Nefrologia postępy w 2008 r. Polskie Towarzystwo Wakcynologii. Med Prakt. 2009;3:81-3.
5. Gętek M, Nowakowska-Zajdel E, Czech N, et al. Quality of life patients on dialysis and after renal transplantation. AAMS. 2010;64(5-6):23-30.
6. Małyszko J, Małyszko JS, Bochórzewska-Gajewska H. Problemy nefrologiczne spotykane w oddziale kardiologicznym. Białystok: Wyd. Uniwersytet Medyczny w Białymstoku; 2009. p.153.
7. Banachowicz W. Analiza przypadków ostrej niewydolności nerek. Now Lek. 1999;68(5):573.
8. Książek A, Rutkowski B. Nefrologia. Lublin: Wyd. Czelej; 2004. p.173.
9. Kokot F. Ostra niewydolność nerek w przebiegu sepsy – aspekty patogenetyczne i lecznicze. Med Prakt. 2005;03:213-6.
10. Myśliwiec M. Choroby nerek. Warszawa: Wyd. Lek. PZWL; 2008. p.305.
11. Daugirdas JT, Blake PG, Ing TS. Podręcznik dializoterapii. Lublin: Wyd. Czelej; 2008. p.63.
12. Rutkowski B. Leczenie nerkozastępcze w praktyce pielęgniarskiej. Gdańsk: Wyd. VIA Medica; 2008. p. 34-446.
13. Dąbska-Ślizień A, Śledziński Z, Rutkowski B. Jak żyć z przeszczepioną nerką. Lublin: Wyd. Czelej; 2006. p.23-109.
14. Leowski J. Polityka zdrowotna, a zdrowie publiczne. Warszawa: Wyd. CeDeWu; 2010. p.11-7.
15. Rutkowski B, Czekalski S. Rozpoznanie i leczenie chorób nerek – wytyczne, zalecenia i standardy postępowania. Poznań: Wyd. Termedia Wyd. Med.; 2008. p.194-211, 228-35, 319-41.
16. Gętek M, Czech N, Białek-Dratwa A, et al. Jakość życia chorych poddawanych przewlekle leczeniu nerkozastępczemu – przegląd piśmiennictwa. Hygeia Public Health. 2012;47(2):151-6.

Informacje o Autorach

Mgr Gałecka Anna – pielęgniarka oddziałowa, Oddział Nefrologiczny z Pododdziałem Dializoterapii, Samodzielny Publiczny Szpital Kliniczny Nr 1 w Zabrzu im. Prof. S. Szyszko, Śląski Uniwersytet Medyczny w Katowicach; lek. med. Michał Ekkert – prezes, Szpital Miejski w Knurowie Sp. z o.o; dr hab. n. med. Ewa Nowakowska-Zajdel – adiunkt habilitowany; dr n. med. Andrzej Kozowicz – adiunkt; prof. dr hab. n. med. Małgorzata Muc-Wierzgoń – kierownik; dr hab. n. med. Teresa Kokot – adiunkt habilitowany, Katedra i Oddział Kliniczny Chorób Wewnętrznych, Wydział Zdrowia Publicznego, Śląski Uniwersytet Medyczny w Katowicach.

Adres do korespondencji

Anna Gałecka
ul. Rymera 4/2, 41-800 Zabrze
tel: 793 56 83 83
E-mail: anna_galecka_2008@o2.pl