

STUDY REGARDING THE CHRONIC RENAL FAILURE IN BRASOV COUNTY BETWEEN 2000 AND 2009 – FROM EPIDEMIOLOGY DATE TO AN INFORMATICS' SYSTEM

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Abstract: *The chronic renal failure (CRF) is a public health issue. This illness is under diagnosed or belated diagnosed in advanced stages with severe complications, influencing the means to slow the disease progression, the only way to survive being the substitution of the renal. Recent studies show that the incidence and the prevalence of CRF cases have constantly risen in Romania. Also, the therapeutic approach is a problem for the Romanian Health System. The number of dialysis centres has grown constantly in parallel with the development of privately owned centers, thus allowing, in the last 20 years, to the number of dialyzed patients to grow 20 fold. In the same time period, the number of persons who benefited from a renal transplant has grown, reaching a rate of over 100 / year. The epidemiologic study is a preliminary stage for the development of the informatics system for payments of dialysis services by the National Health Insurance House and forecasting the dialysis need in our county.*

Key words: *renal failure, haemodialysis, peritoneal dialysis, transplant.*

1. Introduction

The chronic renal failure is the result of the progressive and irreversible destruction of the nephrons, whatever the cause. In recent years, the medical term of CRF tends to be replaced by the chronic kidney disease term. This term defined more precisely the chronic kidney dysfunction [3, 4].

Significant variations recorded in different countries of geographical regions are reflecting the differences between resources, treatment inclusion criteria and/or tracking of the patients. The highest incidence is recorded in the USA and Japan.

In the European western countries the CRF at stage 3 – 5 prevalence is at least 10% of the unselected adult population. In Romania, the prevalence is between 8% and 11% and for the elderly population (over 65 years of age) is about 20%. Because of this reason, this disease can be considered a disease of the elderly people.

The CRF is frequent in the population with cardiovascular diseases of with diabetes. In the same time, the CRF represents one of the important cardiovascular risk factors. Yearly, there are 50 – 100 new cases recorded for 1,000,000 adult inhabitants and 2 new cases for 1,000,000 children under 16 years of age [2].

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The CRF is more frequent in the male population (approximately 60%). Etiological, the chronic glomerulonephritis and the vascular nephropathy are prevalent in men and the chronic pyelonephritis, the renal polycystic disease and the interstitial nephropathy are prevalent in women.

The CRF is considered permanent, independent of the presence or the absence of renal lesions is the glomerular filtration rate (GFR) is under ≤ 60 ml/min/ 1.73 m² for at least 3 months. At high risk patients (diabetes, hypertension, cardiovascular disease), the screening for CRF is performed twice a years and for the other categories once a year of at every hospitalization.

In Romania, the haemodialysis was used for the first time in 1956. In 1974 is created the first chronic haemodialysis centre and in 1995 is used for the first time the continuous ambulatory peritoneal dialysis.

2. Objectives and Methods

Objective: This paper aims to analyze the evolution of the CRF at the level of Brasov County between 2000 and 2009. This subject was approached because of the high rise of the incidence and the prevalence of this disease in the last 10 years.

Method: The observational study was used by analyzing the statistical data from the dialysis healthcare providers and from the Public Health Department and Health Insurance House of the Brasov County.

3. Results

At the level of the Brasov County, the first dialysis site was created in the Brasov

County Hospital, at the nephrology department in 19 May 1994. In 1997, the Children's Hospital created its own dialysis section and in 2000 one dialysis department was created at the Fagaras City Hospital. Starting from 2008 there were created private dialysis sites. Currently, in Brasov County are 5 dialysis services providers.

The creation of the dialysis services providers was possible with the financing from the National Health Insurance House.

At the beginning, the payment for the services was done by global contract and after that by hospitalization day and later by dialysis session and, starting with 2004, the financing was provided via the National Program for Patients with Chronic Renal Failure.

The amounts provided for the financing of the dialysis services by the National Health Insurance House have constantly risen from the time of the implementation of the National Program for Patients with Chronic Renal Failure from 5,754,472 lei (in 2005) to 17,177,322 lei (in 2009) [11].

The appropriation for a patient has risen from 19,507 lei (in 2005) to 36,393 lei (in 2009). The program includes, starting from 2007, the cost of the prescriptions following transplants besides the haemodialysis and peritoneal dialysis services reimbursed initially. [11].

The number of patients with CRF following dialysis treatment has risen constantly from 184 (in 2000) to 472 (in 2009).

From the total number of CRF patients in the Brasov County, 63.56% have been included in the haemodialysis program, 21.19% have been treated by peritoneal dialysis and 15.25% have undergone renal transplantation (Figure 1) [13, 14, 15].

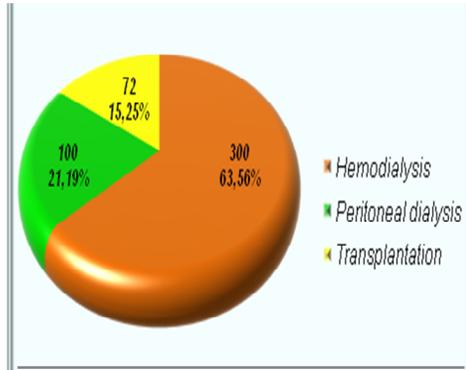


Fig. 1. Share with CRF patients, depending on the method of treatment

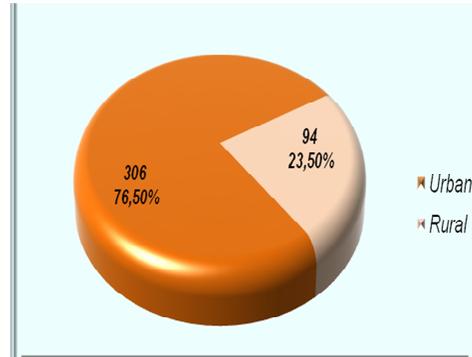


Fig. 3. Brasov county distribution of patients included in dialysis, according to home

Regarding the gender allotment of the patients included in the dialysis program, 57.75% are male and 42.25% are female (Figure 2) [13, 14, 15].

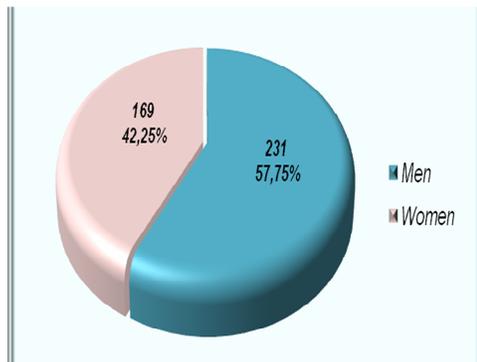


Fig. 2. Share included in dialysis patients with CRF, by sex

By analyzing the distribution of patients with dialysis from the Brasov County after the home placement, 76.5% are coming from the urban areas and only 23.5% are coming from rural areas (Figure 3) [11, 12, 13].

It must be mentioned that the percentages are coinciding with the allotments recorded for the population residence in the Brasov County (75% are living in urban areas).

The analysis of age groups of the repartition of CRF patients included in the haemodialysis program indicated a prevalence of incidence in the age groups between 40 and 70 years of age (Figure 4) [13, 14, 15].

The percentage of patients with CRF in the Brasov County, included in the haemodialysis program and benefiting from an arterio-venous fistula is 52%.

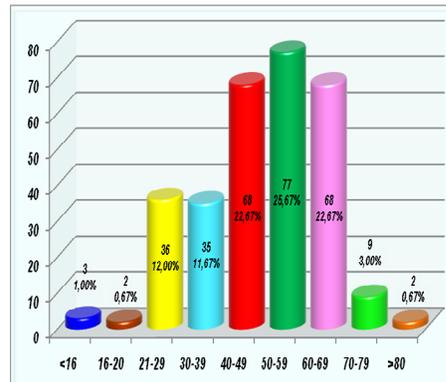


Fig. 4. Distribution of patients in haemodialysis program, by age

Regarding the age of the patients included in the peritoneal dialysis it is observed that the age groups between 50 and 70 years are prevalent (Figure 5) [13, 14, 15].

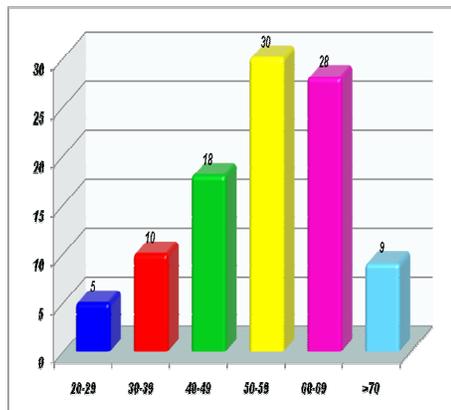


Fig. 5. Distribution of patients in peritoneal dialysis program, by age

By analyzing the age groups of the persons included in the transplant program it is observed that the age is significantly lower compared with age of the persons included in the haemodialysis and peritoneal dialysis programs (Figure 6) [13, 14, 15].

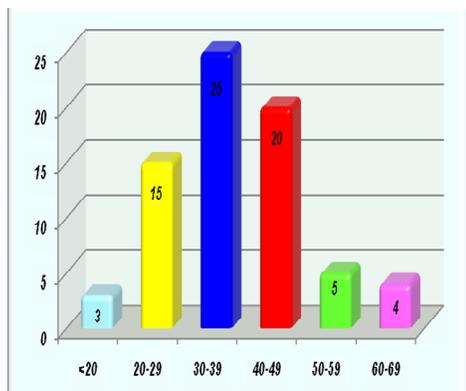


Fig. 6. Distribution of patients in the transplant program, by age

By analyzing the aetiology of the persons with CRF included in the dialysis program it can be ascertained that the main disease

causes are represented by glomerulonephritis (26.5%), diabetes (14.5%) and hypertension (13.25%), causes confirmed also in the specialty literature as the base of the CRF aetiology.

However, a significant percentage of CRF's (24%) cases are with indeterminate aetiology (Figure 7) [13, 14, 15].

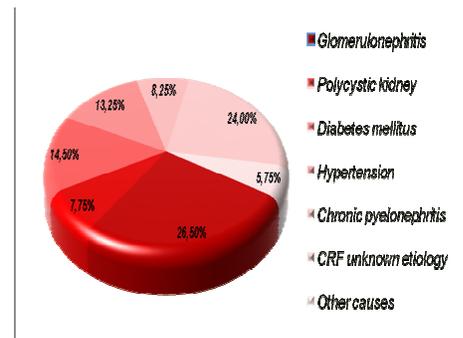


Fig. 7. CRF aetiology of dialysis patients included in program

The polytheistic kidney and the chronic pyelonephritis are still determining CRF in a high percentage (8%).

By comparing the number of patients with CRF by method of treatment at the county, national and European level it is observed that the number of transplant recipients is significantly lower in (Figure 8) [13, 14, 15].

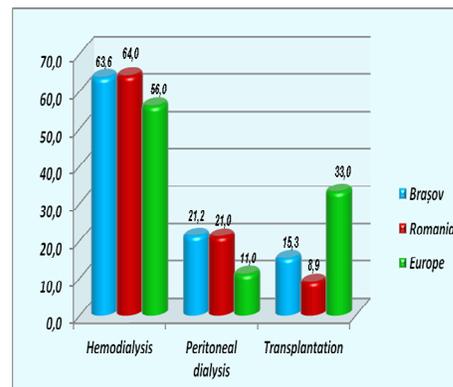


Fig. 8. Distribution of patients by supplying method

At the level of Brasov County, over the studied period of time, the analysis of deaths by CRF shows an increase starting with 2001 up until 2009.

This evolution does not indicate deficiencies in the quality of the services of the healthcare dialysis providers but is determined by the increase of incidence and prevalence of the CRF.

At the national level, the incidence and prevalence of the CRF have increased six times between 1995 and 2003, thus explaining in a way the increase of deaths by CRF (Table 1) [10].

Discussions

Among the used treatment methods, the most frequent used and the Brasov Haemodialysis Centre was the haemodialysis (63.56) with age groups between 40 and 70 years of age.

The haemodialysis is performed ambulatory, in the dialysis centres to where the patients are brought by ambulance 3 times a week. The initiation of the treatment is done after a physical and psychological preparation of the patient. The physical preparation is done by creating a vascular arterio-venous fistula. If the haemodialysis is an emergency, it can be performed via a central venous catheter instead of the arterio-venous fistula, at the level of the internal jugular vein, subclavian vein or femoral vein. Once initiated, the chronic haemodialysis can't be interrupted not until the patient has peritoneal dialysis of renal transplantation. [7, 9]

At the level of Brasov County, the percentage of patients with arterio-venous fistula is 52%.

In the developed countries, the haemodialysis is selective, depending on the financial aspects, logistics and patient compliance. Frequently, the daytime haemodialysis is performed, 2 -3 hours per day, in haemodialysis centres or night time dialysis at the patients' home of the patient, 6 days every week for 6-8 hours per day. These two versions are associated with a good wellbeing, without complications and with a survival higher rate.

The chronic haemodialysis substitutes the renal excretion function and haemostatic function but cannot substitute the metabolic and endocrine functions. Because of this, the chronic dialysis patient has a complex pathology, requiring careful monitoring during the dialysis and after that [1, 5]. The monitoring is performed by

Table 1

Death by Chronic Renal Failure

YEAR	2000	2001	2002	2003	2004
Chronic Renal Failure N170 – N179	37	8	8	10	2
Chronic Renal Failure N180 – N189	0	22	27	42	32
Chronic Renal Failure with unspecified aetiology N190	0	2	8	3	4
TOTAL	37	32	43	55	38

YEAR	2005	2006	2007	2008	2009
Chronic Renal Failure N170 – N179	5	11	5	1	7
Chronic Renal Failure N180 – N189	57	46	52	66	80
Chronic Renal Failure with unspecified aetiology N190	5	5	1	3	1
TOTAL	64	61	58	70	88

clinical and paraclinical investigations of every patient at regulate time intervals. The haemodialysis determines in time a protein and caloric malnutrition that enforces the assessment of different nutritional needs according to the clinical status of each patient.

In Brasov County, in the analyzed period of time, the percentage of patients included in the peritoneal dialysis program was 21.19% with prevailing age groups between 50 and 70 years.

Presently, in Romania, 8300 patients are included in the dialysis program, 400 being from Brasov County. In general, the mean age of dialysis patient in Romania is 52 years compared with the mean European age of 64 years. At the level of Brasov County 76.5% of the patients are from urban areas and only 23.5% from rural areas.

On a global scale, approximately 11% of the patients with terminal renal failure are treated with peritoneal dialysis. In our country this percentage nears 30%.

The data obtained by analyzing the gender distribution of the patients: males (57.75%) and females (42.25%) are comparable with the data mentioned in the specialty literature that indicates an increased frequency in males (60%).

The renal transplantation represents a chronic substitution method of the renal function, ensuring the radical treatment of the chronic uraemia. This method of treatment remains dependent of the immunologic barrier. The success of a renal transplantation is determined by the correct identification of the donor, by the degree of immunocompatibility, by the conditions in which the graft is kept until the transplantation, and the complex immunologic therapy applied to the receiver of the renal graft before and after the surgery. The survival rate and the quality of live of the patients with renal transplantation are clearly higher than the

other dialysis patients [6, 7, 8, 10]. Unfortunately, the renal transplanttation does not represent a solution for all the patients with chronic uraemia. In the case of elderly patients with associated morbidity or chronic infections the dialysis is preferred to the renal transplantation.

At the level of Brasov County, the percentage of persons who benefited from transplantation (15.2%) is higher that the number of persons with renal transplantation at national level (8.9%).

Regarding the analysis of patients with renal transplantation, there is a similitude of proportions represented by gender distribution and after inhabitancy with the proportions of dialysis patients.

Regarding the gender distribution, there is a 2 to 1 ratio for males, coinciding with that recorded for the aetiology of chronic renal failure

As for age, the age of patients with renal transplantation is significantly lower than the age of patients with haemodialysis and peritoneal dialysis.

The number of persons that had renal transplants in Romania is significantly lower that in developed countries (33%). In Romania there are approximately 1300 persons with renal transplantation, 72 living in Brasov County. At a national level, the age of persons with renal transplantation is much lower than the European mean age.

Compared with the treatment methods applied to CRF patients in the western countries, it can be ascertained that in Romania the haemodialysis (64% compared with 56%) and the peritoneal dialysis (21.2% compared with 11%) are more frequently.

The aetiology of the CRF of patients included in the renal function replacement program is similar to that mentioned in the specialty literature. However, a significant number of cases with chronic renal failure remain with unspecified aetiology.

6. Conclusion

The CRF is a public health problem by lack of an efficient treatment from the onset of the disease. The social impact of the disease is higher when affecting persons are able to work.

The disease is under diagnosed or diagnosed with delays sometimes only at the moment of severe complications.

The CRF represent one of the most important factors of cardiovascular risk, this representing a major acute renal failure risk and drug induced nephrotoxicity, requiring a strict monitoring of patients.

The incidence and the prevalence of the CRF have significantly siren in the last 10 years.

It can be said that, at the level of Brasov County, the number of persons with renal transplantation in the studied period is higher (15.2%) when compared with the national level of renal transplants (8.9%).

In general, in Romania, the mean age of dialysis patients is 52 years of age, compared with the European mean age of 64 years of age.

Regarding the age and the number of patients included in the transplant program in Romania, the values are significantly lower than the European mean.

The problems raised by the dialysis and the transplantation such as financial, management of the cases and ethic ones taking into account the importance and the frequency of the disease demonstrate the necessity to implement informatics software to facilitate a better coordination of centres in Brasov County.

Taking into account the complexity of the pathology and co-morbidity, it is necessary a attentive, coherent in time and integrative approach to develop a software not only capable to process the data from CRF patients charts but to manage with

efficiency the cases that require dialysis or renal transplantation with evaluation and permanent re-evaluation based on an algorithm capable to alert the medical staff on new complications and to ensure the primary and secondary prophylaxis.

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