PREVENTION OF CHRONIC RENAL DISEASES

Dr. Fejzi ALUSHI¹, Nestor THERESKA²

¹"Ismail Qemali" University of Vlora, Albania

²Tirana University, Albania

ABSTRACT

It is easier to prevent a disease than to cure it. This postulate is a foundation stone of the contemporary medicine, furthermore its mission. The Chronic Kidney Diseases (CKD), amongst them the Chronic Pyelonephritis (CP) and the mass kidney reduction take an important place in human pathologies in general, and in particular in renal ones. The Chronic Pyelonephritis are chronic renal pathologies, which on one side are of various causes and on the other side are multi systemic. At the same time they tend, earlier or later, depending on their course, to bring the patient towards the Chronic Kidney Insufficiency in stage of uremia, consequently in need of substitution therapies e.g. dialysis, peritoneum dialysis or transplant. It is worthy to emphasize that from the prevention and correct cure of CP make profit the patients, the family, the state and in the last analyses the entire society, because in that way the budget expense destined for the fore going substitution cures, dialysis, peritoneum dialysis or transplant, is considerably reduced. The same should be mentioned in relation to the CP and the mass kidney reduction, speaking about our country, which are still at the first place as the very cause of Chronic Kidney Insufficiencies (CRI), later on advancing toward uremia and terminal uremia along with its grave consequences. In general the very foundation of the CP is on the infections of urinary roads, in particular on the complicated ones, among them it should be mentioned-congenital kidney anomalies, renal calculosis so much present in our country, and pathologies of segment or vesical-ureteral reflux, and rarely the pathologies of prostate.

UDC CODE & KEYWORDS

■ UDC: 616.6 ■ Chronic Kidney Disease ■ Insufficiencies ■ Prevention.

INTRODUCTION

The thesis-epidemiology of chronic kidney diseases in the district of Vlore, assumes a particular significance. Firstly for giving a contribution in evidencing of the patients suffering from CDI (chronic kidney diseases) and secondly to help for preparing of the basic national register of nephrology. The chronic kidney disease CKD is a pathology which recently is being worldwide manifested as a clinic entity in exponential increase. Nowadays the CKD is considered as one of the greatest problems of medicine. The recent epidemiologic data denote such an alarming situation which according to most of the authors is qualified as a real social emergency. A report of LYSAGHT give in evidence the fact that worldwide there are more than one million of people to undergo the dialysis with an increasing rate 7% year after year; further the forecast was for a twice increase of patients undergoing dialysis in the year 2010. The group of chronic kidney diseases is ranked on the top of human chronic pathologies as a whole. For this reason the prevention and correct cure of chronic kidney diseases is a significant link in health services as a whole, furthermore a mission of contemporary medicine. In our country the most frequent cause of chronic kidney diseases still remain the chronic pyelonephritis, which seem to be revealed in over 50% of chronic kidney diseases; consequently the prevention of them become an essential need.

Main text

In order to prevent the Chronic Kidney Diseases originated of Chronic Pyelonephritis, firstly it should be known the very causes of them, secondly they should be correctly cured at the moment of their manifestation so that to delay as much as possible the installation of irreversible impairments. These impairments frequently bring about the patient at the stage of uremia. The Chronic Pyelonephritis and kidney mass reduction are frequently revealed as the very cause of Chronic Kidney Diseases. In a study report of 2006 related to the infections of urinary roads in general, and those complicated in particular, from the amount of 922 cases of insufficiency of urinary roads. 657 cases or 71,2% are simple infections, whereas 265 cases or 28,8% are complicated infections. It is worthy to emphasize that from 265 cases of complicated infections of urinary roads, only 7,5% of them are originated of Chronic Pyelonephritis, whereas in 68 cases with renal calculosis of infections of urinary roads, only 8 cases or 11.8% underwent to nephrotomy. Such patients are kept in observation as cases with a high risk potential for bringing about the patients toward the chronic kidney diseases.

From the world reports' data and those of our country it results that the chronic pyelonephritis, in particular those at advanced stage, are considered as frequent pathologies with a high risk potential for bringing about the patients toward uremia and later on toward terminal uremia; in addition to that the chronic pyelonephritis have a considerable social impact related to budgetary expense for substitute therapies of patients in such a need. The annual budgetary expense for each patient in dialysis is approximately 25 thousands euro. Most of the authors speaking about the problems related to the chronic kidney diseases, among them including those originated of chronic pyelonephritis, denote that they are getting the feature of a real social emergency because the cases of chronic kidney diseases have been exponentially growing, mainly for the following motives:

- longevity
- delayed diagnosis
- disease's progress up to stage of uremia without apparent disturbs or symptoms.

PREVENTION OF CHRONIC RENAL DISEASES

Considering the afore going, it means that the prevention, revealing in time, furthermore a correct curing of Chronic Kidney Diseases in general, and of chronic pyelonephritis in particular, impedes their progress towards the stage of uremia, at least in 20% of the cases.

The Insufficiencies of Urinary Roads, in particular the complicated ones, share a significant place into the group of renal pathologies, for they have a tendency to go up impairing the kidney causing chronic pyelonephritis, which on their side, sooner or later, depending on their course, progress toward uremia and up to terminal uremia. Let's make an analysis of a study consisting in 922 cases:

Table 1: Insufficiencies of Urinary Roads /Year 2005, Gender

Male	Female
295	627

Source: Author

As the above table denotes, from 922 cases of insufficiencies of urinary roads, 627 or 68% are female patients, and 295 cases or 22% are male ones.

Obviously such a percentage share it is related to female uro-genital structure, in particular the adjacency of extern ureteral meatus to anal hole. On the contrary, speaking about the complicated insufficiencies of urinary roads, the cases of male patients are more frequent than the female ones.

Furthermore, among the 922 cases of insufficiency of urinary roads, 265 cases or 28,7% are complicated. Divided accord to gender and the cause, confirmed by echo graphic, there are the following data:

Table 2: Insufficiency of urinary roads, Cause

Insufficiency of urinary road (Cause)	Male 168	Female 97	Total
Ureter impedance	69	56	125
Renal calculus	44	24	68
Urinary vesica calculus	3	0	3
Acute pyelonephritis	8	12	20
Prostate adenoma	33	0	33
Ureter stricture	2	0	2
Papilloma of urinary vesica	6	2	8
Renal agenesis	0	2	2
Renal ectopia	0	1	1
Renal polycystosis	1	0	1
Paraplegic patients	2	0	2

Source: Author

- 125 cases or 47% with ureter impedance, originated of unilateral calculus
- From 125 cases with unilateral ureter impedance, 69 or 55,2% of cases are male patients, and 56 cases or 44,8% are female patients.
- 68 cases or 25,6% are patients with renal calculus.
- From 68 cases of patients with renal calculus, 44 cases or 74,7% are male, whereas 24 cases or 35,3% are female patients.
- 3 cases or 1,1% are with urinary vesica calculus and all of them male patients.
- 20 cases or 7,5% are with chronic pyelonephritis, from them 12 cases or 60% are female patients and 8 cases or 40% are male patients.
- 33 cases (male) or 12,4% of total amount are with prostate adenoma.
- 2 cases (male) or 7,5% of total amount are with uretre stricture.
- 2 cases (female) or 0,75% of total amount are with renal agenesis .
- 1 case (female) or 0,37% of total amount is with renal ectopi .
- 1 case (male) or 0,37% of total amount is with renal poly cystosis
- 2 cases (male) or 0,7% of total amount are paraplegic

As the above data denote the most frequent cause of stasis which advantage the urinary infection is ureter impedance (renal calculus); the percentage of such a situation is 47% of cases with complicated insufficiency of urinary roads.

There is also another finding: ureter impedances are more frequent for male patients, that is 55,2% of all cases. Renal calculus following in order the uretre calculoses take the second place wit 25,6%, further on 64,7% of them belong to male patients.

The urinary vesica calculus is another component group of insufficiencies of urinary roads, consisting in 1,1% of them.

Pyelonephritis is another group of the insufficiencies of urinary roads, complicated ones, equal to 7,5% of them.

Prostate adenoma is a significant group ,as the very cause of the insufficiencies of urinary roads, complicated ones, equal to 12.4% of them.

With a smaller percentage we find out the papilloma of urinary roads 3%, ureter stricture 0,75%, unilateral agenesis of kidney 0,75%, renal ectopia 0.37%, renal poly cystosis 0,37%, paraplegic patients 0,75% of cases.

Table 3: Echographical Valuation of Stasis, 125 cases with ureter impedance, year 2005

Grade of stasis	Male	Female	Total
First grade	31	25	56
Second grade	32	27	59
Third grade	4	3	7
Fourth grade	2	1	3
Total	69	56	125
Stasis of unique kidney.	3	2	5
Bilateral ureter impedance	2	0	2

Source: Author

The use of echographic examination in nephro-urologic clinic practise is an epocal achievement; following there are some motives :

- Echographic examination is comfortable, not invasive and not impairing.
- Through such an examination can be detected the form, dimensions, kidney's position, prostate's position, and furthermore the presence of stasis, residual urine and urinary retention.
- Apart of detecting the stasis, it is possible to make the stasis assessment, its grade and to follow up progressively patient.
- Echographic examination helps in early detection of various anomalies, grade of kidney's impairment, helping in a right orientation so that to intervene in time and to prevent progressively impairments of the urinary apparatus .

Thus, through the echographic examination it was possible to detect the stasis's presence caused by ureter impedance; and for the 125 afore mentioned cases 100% of them there was present renal calculus; at the same time through echographic examination it was detected the grade of stasis, as follows :

- 56 cases or 44,8% were stasis of first grade, 31 cases or 55,3% of them male patients
- 59 cases or 47,2% were stasis of second grade, 32 cases or 54,2% of them male patients.
- 7 cases or 5,6% were stasis of third grade, 4 cases or 57,1% of them male patients.
- 3 cases or 2,4% were stasis of fourth grade, all of them male patients.

Whereas in total the above table denotes that from 125 cases of various grade of stasis, 69 patients or 55,2% were male, and 56 patients or 34,8% were female.

According to above data, 115 cases or 92% are patients of the first grade.

This denotes that a correct and suitable treatment, through protocol, further more the dynamic following up of patients has made possible the correction and elimination of stasis, consequently preventing its deterioration and impairments.

Table 4: Valuation of renal stasis and renal impairments through Echography and Intravenous Urography 68 cases/Year 2005

	Male 44	Female 24
First grade stasis - Echography	20	9
Second grade stasis - Echography.	13	8
Third grade stasis - Echography.	6	4
Fourth grade stasis Echography&Intravenous Urography detected failure of renal function.	5	3
	All five cases with previous nephrotomy	All three cases with previous nephrotomy

Source: Author

According to above table, let us make the following valuation :

- 29 cases or 42,6% with renal calculus of the first grade, 20 cases or 69% of them male patients and 9 cases or 31% of them female patients.
- 21 cases or 31% with renal calculus of second grade, 13 cases or 62% of them male patients and 8 cases or 38% of them female patients.
- 10 cases or 15% with renal calculus of third grade, 6 cases or 80% of them male patients and 4 cases or 40% of them, female patients.
- 8 cases or 11,7% with renal calculus of fourth grade (dilatation up to disappearance of renal parenchyma with failure of renal function, confirmed through intravenous urography, too); 5 male patients and 3 female patients, all of them with previous nephrotomy.

In general, we can observe that even the renal calculoses of stasis of various grades are more frequent in male patients than in female ones; furthermore the stasis of first and second grades are more frequent than those of third and fourth grades. As the table denotes there are 50 cases or 73,5% of them with stasis of first and second grades. Such cases have taken advantage of, not advancing toward other grades or renal impairments, dynamic following up of the patients by using echographic exams or depending on the very case by making use of lithotripsy, the last one resulted efficient for all the recommended cases. We can see that from the 68 cases of patients with renal ureter calculoses, only 8 of them underwent nephrotomy, that is kidney mass reduction was installed in eight cases or 11,8%.

In such a phase, the substitution therapy treatment becomes indispensable.

P.S. According to the international nomenclature, there will be considered as Chronic Kidney Disease (chronic renal insufficiency) the cases with FG < 60 ml/min per 1,73m² of body surface, in presence of renal impairments (albuminuria or evident proteinuria, biochemical alteration) and other anatomic and renal hispathologic alterations.

The main indicative signs of renal impairment are :

- Persistent proteinuria
- Anomalies of urinary sediment
- Biochemical variations of blood and urine
- Imagery variations
- Anatomic variations and typical hispathologic variations

There is a great deal of causes of chronic kidney diseases, amongst them:

The primary causes:

- Chronic pyelonephrites
- Chronic glomerulonephrites
- Renal poly cystoses and medullary cysts
- Bilateral stenosis of renal arteries
- Obstructive neuropathies
- Calculus of urinary apparatus
- Acute renal insufficiency
- Kidney mass reduction (nephrotomy)
- Tumor
- Interstitial nephrites

The secondary causes:

- Diabetic nephropathy
- Lupic nephropathy
- Nephropathy from amiloidose
- Nephropathy from uric acid

Tertiary causes/or risk factors

- Hypertension
- Diseases of cardio vascular apparatus
- Diabetes mellitus
- Autoimmune diseases
- Infections of urinary tract
- Urinary obstructions
- Calculus
- Tumor
- Kidney mass reduction (nephrotomy)
- Drug exposition
- Obesity
- Underweight births
- Advanced age
- Smoking
- People with low standard of living and culture

It is worthy to emphasize that the greatest part of chronic kidney diseases impair silently and for a long time the kidney, that is without clinic phenomena or characteristic signs, up to advanced stages; in special cases up to the stage of terminal uremia, so that to impose the hemo dialysis or transplant.

The world reports related to this epidemiologic transition denote that in the Great Britain, referring to adults, the frequency of chronic kidney diseases arrives at 1 case for 10 people. In the United States of America, accord. to a report, 2 March 2007, for the period 1997-2004, the chronic kidney diseases were present in 17% of adults, further the value of FG was lesser than 60 ml/min per 1,73m² of body surface; further more there are reported data denoting that 9,6% of adults has been suffering of chronic kidney diseases, and 6% of them had a low renal function up to 50% of normal values.

In Europe, e.g. Groningen (Holland), 12% of adults has been suffering of chronic kidney diseases and 6% of them had a low renal function up to 50% of normal values. The same data are reported for Northern Spain and Ireland. The chronic renal insufficiency is recently a pathology which is progressively presented as an entity with exponential growth worldwide. Epidemiologic data reveal an alarming situation so that to make appeal and worry the World Health Organization, the political systems of various countries including those in development. Several years ago a report of LYSASAGHT made known that the number of patients in dialysis was more than one million with a growing rate 7% per year, and the forecast was for a double growth of them by the 2010. The situation in Europe is very similar, too, and recently a report of Belgian group depicted the situation in 25 countries, where every year the number of patients has been increased with 65.000 new patients. In the mean time there are 370.000 patients under treatment, two third of them in dialysis. With other words, we have an incidence equal to 137 patients and prevalence of about 786 patients for one million of people, respectively.

Frequently the chronic renal insufficiency CRI is not a mere disease in itself neither a part of kidney as a congenital one; in most of the cases it is as a part of the cases caused by other pathologies, frequently well depicted and known, which silently and not painfully afflict the kidney, just as it occurs with diabetes, hypertension, cardiopathy and so on.

In a famous report, edited in NEJM, where there were scanned one million of cardiopathic patients, it was an evidence related to the fact that the complication of kidney through various forms of chronic renal insufficiencies, used to increase exponentially the risk of death or other undesirable events. Furthermore the patients with chronic renal insufficiencies had an increase of percentage for such a group of patients. The authors commented the situation related to chronic renal insufficiencies figuring it out as a real social emergency.

On the basis of such an assessment should be the lifetime growth as a consequence of mortality reduction, which in itself serves as a premise to make possible the renal diseases advance on the years. In the mean time it should not be neglected the fact that assignment of diagnosis is frequently delayed, consequently delayed will be the prevention measures, too. Another argument to end it up: the disease in itself frequently do not manifest certain symptoms or makes advance without apparent disturbs.

In Italy, failure in assignment of diagnosis (disease) brought about the uremia for 20% of patients ending up in dialysis treatment. The number of patients going to dialysis treatment is all time increasing. Thus, according to the data of the Italian Register of Transplants, in 1972 the number of transplants was 611. Further more in March 2006, the number of patients waiting for dialysis was 6339. The patients under dialysis treatment are considered as the iceberg top because as the valuations suggest, one patient in dialysis corresponds to a number of 200 other patients with a compromising condition of renal function. According to a proximal valuations there are nowadays about 300 millions of people all over the world who suffer a renal injury, but only a part of them develops towards the uremia stage in which should it be necessary a treatment with substitute therapy, that is dialysis or transplant. Unfortunately the clinic data denote that a great deal of patients affected by a renal damage, ever so easy, do not develop up to the dialysis stage, because they cease to be alive ahead of time for cardiovascular diseases.

If, in Italy the prevalence of renal diseases is the same to the USA, as reported by Thomas D. Dubose, the President of the American Nephrology Association, then this prevalence in Europe should be the same to the USA. Nowadays in Italy there are 2 million and two-hundred thousands patients with chronic renal insufficiencies, yet not under dialysis treatment, really a fearsome cipher. In the USA it is accounted a cipher of 20 millions of persons with persistent proteinuria. A study report of Faenza about the prevalence of nephropathies denotes that 40% of population might be affected of nephropathies only by making use of the index of increased plasmatic creatinine.

A better acquaintance of renal diseases' epidemiology in our country would have made possible a correct and detailed program about the human and economic resources available for substitution therapies, related to the advanced stages of chronic renal insufficiencies, furthermore in giving a hand for a suitable prevention of these diseases. The public health data should be conjoined to the data of sanitary cost.

In the afore going cited report of LYSAGHT we find other data related to the cost for one patient in dialysis. In the USA the cost is 66.000 USD for one year; the total of such a cost is 80 milliard.

In Italy there are no expected data for the sanitary cost spent for such patients; nevertheless by calculating the reimbursement tariff for dialysis multiplied to séances of dialysis and number of patients, the cost will be enormous.

The data provided from the Italian state reveal that the cost of one dialysis is 150 Euro per patient. Making calculations for 35.000 patients:

- cost for one patient; 22,800 euro/year
- cost of all patients in dialysis; 800 million euro.

The cost of expenses becomes even bigger by adding up the cost of transport/home to hospital and vice versa, drugs, hospitalizing and nursing, supporting and tutoring, lastly the cost of invalidism and so on. It should be obviously reckoned the job lost which frequently render the patient a definitive invalid.

The data of the year 2004 with reference to some European countries denote the sanitary cost expressed as percentage ratio of the Gross National Production (GNP) to the General Domestic Production (GDP), as follows: Europe-8,6%, EC.(25 states)-8,8%, Italy-8%, Germany-11%, France-9.5 %, United Kingdom-7.8 %.

From these data by a correlative valuation we can account the cost of dialysis as a ratio to the sanitary cost; in Italy the cost of dialysis for treatment of patients in need of chronic dialysis (0,08% of whole population) is 25 times bigger than the sanitary cost per capita.

In Germany, (number of patients under dialysis treatment 0,08% of whole population) this ratio is 20, in France (0,05% of whole population under dialysis treatment) 35, in Great Britain (0,03% of whole population under dialysis treatment) this ratio is 30. From the above mentioned we see that the cost of chronic periodic dialysis is preponderant in sanitary cost of each country.

According to the data of JASN (Journal of the American Society of Nephrology), September 2010, recently there were a lot of discussions on epidemiology of kidney, mainly focused on what are named as chronic kidney disease (CKD) and renal disease at final stage (ERSD). The data of the recent year report on renal system in the USA, denote that the incidence of renal diseases at final stage is 354 millions persons each year. Furthermore, the data of above mentioned report, denote that in the USA during the years 2001-2007, the incidence of CKD at terminal stage has been gradually stabilized going to a growth rate approx. 1% each year. This has been reached, on one hand, due to a more liberal use of dialysis, and on the other hand, due to a better effectiveness of drugs' use which restrain the renin-angiotensin system in curing of hypertension, further due to the correct check and cure of diabetes type I. Thus, the patients diagnosed on the years 80-90 had half of the risk to develop the chronic kidney diseases than those of the years 1965-1969.

As a matter of fact we have to deal with a vital investment (as a recent report of the World Medical Association call it) which bring about reduction of renal diseases. Nevertheless the chronic kidney diseases frequently do their advance silently, that is why the population should be engaged in a process of information and education.

The chronic renal insufficiency should be considered as a disease in increase, with a sensible social impact; in the mean time there is an increased attention in confronting it because nowadays it is admitted that even the mildest renal insufficiency increases the risk of cardiovascular mortality. That is why it is more profitable, consequently more important to prevent it or to preliminarily cure it. The main criterion which might direct our attention being at the same time as a alarm bell, is a simple analysis of urine, a thing more economic, penetrating and recurring.

Revealing in time of renal diseases, correct curing of them, would make possible to prevent their progress toward terminal uremia, further toward dialysis at least for 20% of cases. Thus it would be possible to save the life of many patients, besides the economic profit by saving national finances. Undoubtedly prevention, correct curing and elimination of risk factors is the very foundation which impedes the installation and retardation in time of chronic kidney diseases.

We must accept the postulate of medicine regarding the prophylaxis or prevention, which means it is easier to prevent a disease than to cure it. That is why I have chosen to deal with such a thesis just to underline the significance of taking measures to prevent the chronic kidney diseases, to say it better, to eliminate the advancing tendency of renal impairments. On the other hand such a thesis is the first to study the phenomena serving as a example for other studies in Albania.

In the last analysis, having a good grasp, evidence and revelation of the very causes, furthermore elimination and correction of risk factors undoubtedly would have an important influence in reduction of cases with chronic kidney diseases as well in retardation of chronic renal insufficiencies' installation. This thesis is somewhat theoretic but its importance is practical because through such a study we might make present the cases of renal diseases, their widespread in our district, further more to switch on the green light regarding the need of prevention and elimination of the very causes and risk factors which help the renal impairments' aggravation and imminent installation of chronic kidney diseases and their consequences.

Within the group of renal diseases which bring the patients toward chronic kidney diseases there are included a great deal of illnesses which might be acute, chronic, primary, secondary, tertiary, fast or slowly advancing. According to the data of contemporary reports, the secondary nephropathies, in particular those related to diabetes mellitus and systemic diseases, are considered as the very cause of chronic kidney diseases.

It is worthy to emphasize that to make a diagnosis of renal diseases is generally easy because just to make a simple urine analysis and the physician would have a clear vision to reveal the diseases of kidney. Furthermore there are other anamnestic data, clinical presentations, bio chemical analysis, renal radiology and schintology controls. A great help in clinic practice regarding the diagnosis of renal diseases is the echography of urinary apparatus, renal puncture biopsy, immunologic examinations. All of them make an exact diagnostic assessment of almost all renal pathologies, combined all these clinic data with pathognomonic signs of kidney's affection, e.g. proteinuria (albuminuria), hematuria and leukocyturia.

Conclusions

From the above mentioned we see that the cost of chronic periodic dialysis is preponderant in sanitary cost of each country.

Undoubtedly in our country, too, the cost of dialysis takes a considerable part of the sanitary cost; in the year 2007 there were 267 patients enrolled to undergo dialysis treatment and actually the number of them and those waiting is bigger.

From all above we realize that the chronic renal insufficiency CRI should be considered as a disease of an increasing frequency and with a sensitive social impact, because even in its slightest manifestations it will largely increase morbidity, invalidity and mortality, in particular on the cases where the disease itself in its course develops cardiovascular complications.

In the last analysis, there should be as a priority the prevention and correct medical treatment of chronic renal insufficiency CRI, so that to prevent or to delay it as long as possible. Thus, revealing in time of a chronic kidney disease CKD and a suitable medical treatment in due time, is an advantage in impeding of them to develop towards chronic kidney insufficiency, further towards dialysis, at least by a diminution of 20%.

Should it be realized such a thing it will be possible, on one side to turn back in normal life a great deal of patients, and on the other side to have a considerable profit in relation to the state budget.

REFERENCES

1. Alloati S, Strippoli GFM, Bucciati G, Conte F, Schena FP. *Current Structure and organization for renal patient assistance in Italy*, Nephrol Transpl. 2007.
2. Center for Disease Control and Prevention USA, *Prevalence of Chronic Kidney Disease and Associated Risk Factors, United States, 1999-2004*, MMWR 2007
3. Simeoni PG, Bonomini M, Brigante M et al, *Censimento 2004 dei Centri di Nefrologia e Dialisi Italiani. Abruzzo, Lazio, Marche, Molise, Umbria*, G Ital Nefrol 2006
4. Chadban SJ, Briganti EM, Kerr PG et al., *Prevalence of kidney damage in Australian adults; the AusDiab kidney studies*, JAm Soc Nephrol 2003
5. Coresh J, Byrd- Holt D, Astor BC et al., *Chronic kidney disease awareness, prevalence, and trends among US adults 1999-2000*, J Am Soc Nephrol 2005
6. Hallan SI, Coresh J, Astor BC et al, *International comparison of the relationship of the chronic kidney disease prevalence and ESRD risk*, J Am Soc Nephrol 2006
7. Alloati S, Gribotto G, Quarello F, Salomone M, Bucciati G., *Census 2004 of the Italian Renal and Dialysis Units. Piemonte-Liguria-Valle d'Aosta*, G Ital Nefrol 2005
8. Bucciati G, Alloati S, Conte F, Pedrini L, *Census 2004 of the Italian Nephrology and Dialysis Unit*, G Ital Nefrol 2006
9. Lusenti T, Santoro A, Cappelli G et al, *Census 2004 of the Italian Renal and Dialysis Units. Emilia-Romagna, Toscana*, G Ital Nefrol 2006
10. De Zeeuw D, Hillege HL, De Jong PE, *The kidney, a cardiovascular risk marker and a new target for therapy*, Kidney Int Suppl 2005