# End-stage renal disease in Slovak children: epidemiology from a European perspective

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## OBJECTIVES & AIM

The pediatric population suffering from end-stage renal disease (ESRD) is growing. Children with formerly lethal diseases nowadays survive until adulthood and beyond. The number of children on renal replacement therapy (RRT) has almost tripled during a relatively short period of 20 years [1], but current reliable epidemiological information is lacking from Slovakia and some other countries.

Aim of the study was to examine the occurence of ESRD in Slovak children; to compare it with earlier data on Slovakia and with data from neighboring European countries; and finally to explore the etiology and it's ethnic differences as well as treatment modalities.

## METHODS

Questionnaires were sent to all four pediatric dialysis and transplantation centers in Slovakia collecting data regarding patients on RRT over the years 2003-2009. For each patient *age, gender, ethnicity* and *clinical variables* (primary renal disease, the date and mode of the first RRT and changes in treatment modes) were retrieved. Incidence and prevalence rates of RRT were calculated per million age related population.

## RESULTS

- 83 patients (51 boys, 32 girls) not yet 19 years old underwent RRT during the years 2003-2009 in Slovakia
- 52 new patients reached ESRD before age 19 and initiated RRT in 2003-2009

**Fig.1 Epidemiology of ESRD in children in Slovakia**

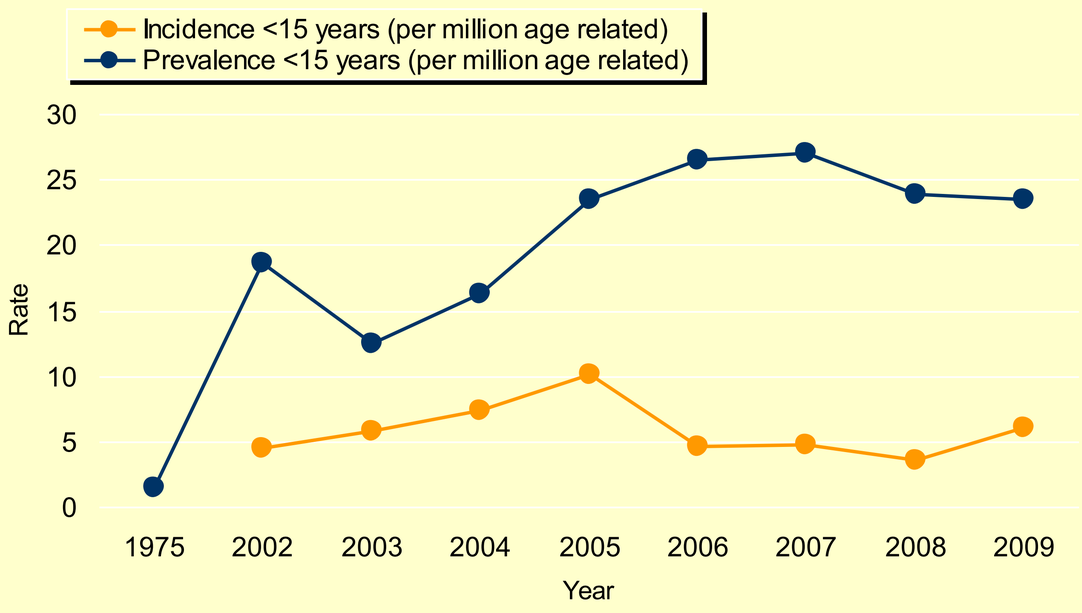



**Fig.2 Epidemiology of ESRD in children in Europe (ESPN 2008 dataset)**

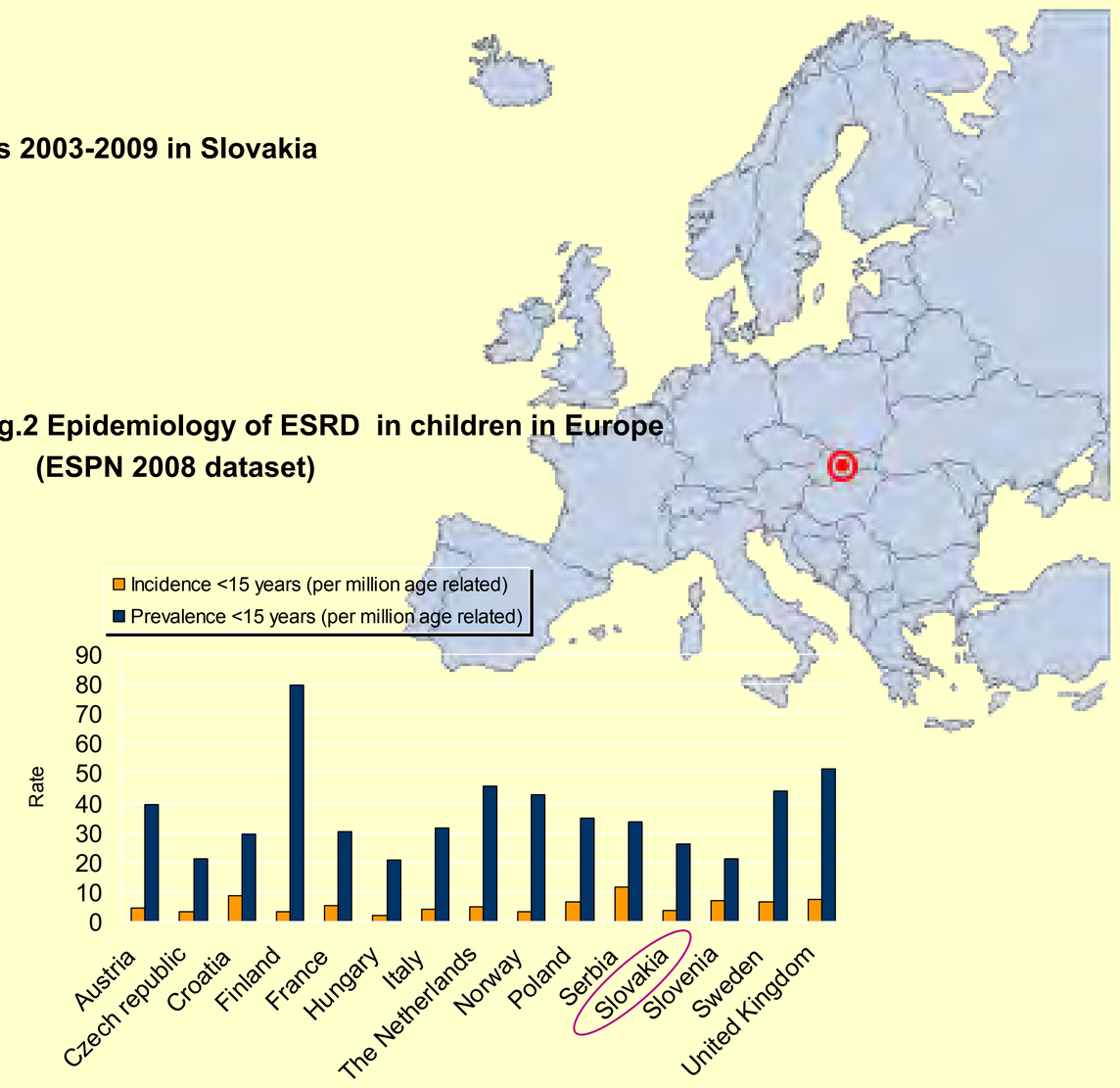



**Fig.3 Ethnic differences in epidemiology of ESRD in Slovakia**

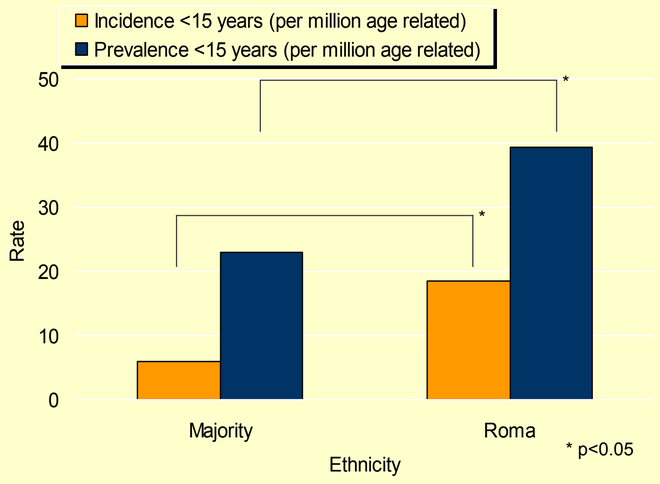
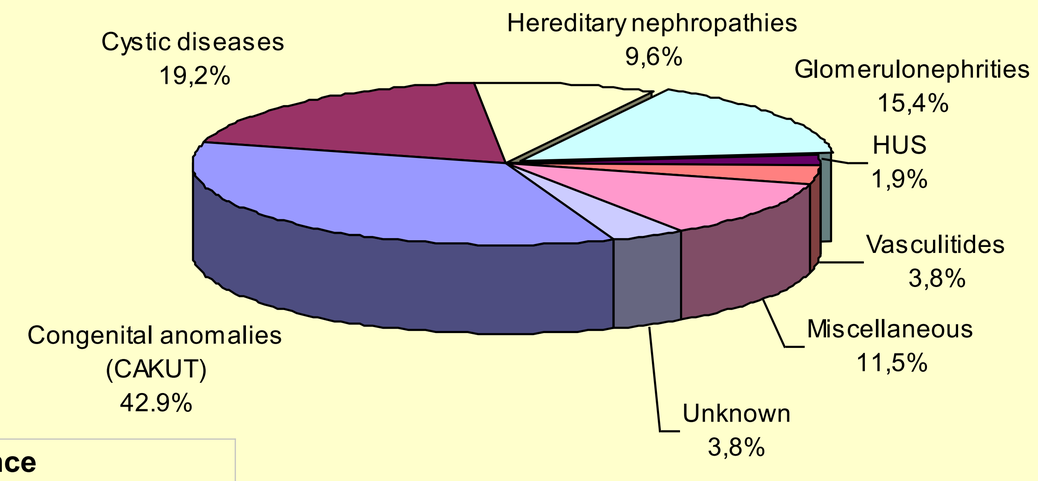



**Fig.4 Etiology of ESRD in incident children**



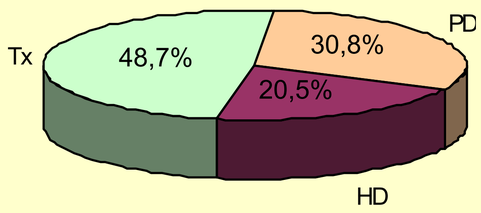

**Tab.1 Ethnic differences in etiology of ESRD in children in Slovakia**

| Etiology | Incidence | |
|---|---|---|
| | Majority [pmarp] | Roma [pmarp] |
| Congenital anomalies (CAKUT) | 2.1 | 5.8 |
| Cystic diseases | 1.1 | 3.5 |
| Hereditary nephropaties | 1.6 | 4.6 |
| Glomerulonephritides | 8.1 | 3.5 |
| Hemolytic-uremic syndrome (HUS) | 1.6 | 0.0 |
| Vasculitides | 3.3 | 0.0 |
| Miscellaneous | 9.8 | 0.0* |
| Unknown | 1.6 | 1.2 |
| Total | 5.9 | 18.6* |

pmarp – per million age related population

* p<0,05

**Fig.5 Treatment modalities of prevalent ESRD children (31st Dec. 2008)**




## CONCLUSIONS

- compared to the first (1975) Slovak study on epidemiology of ESRD in children current prevalence exceeds ten-fold
- during the last decade the Slovak incidence and prevalence rates of ESRD in children have remained stable
- the comparison with neighboring countries and with European average shows no significant difference in incidence
- prevalence is significantly lower compared to neighboring Austria and some other (mostly western) European countries as well as the European average
- significant differences in occurrence of ESRD were found between majority and Roma population in Slovakia
- etiology mainly concerned congenital anomalies (34.6%) and cystic diseases (19.2%)

1. van der Heijden BJ, van Dijk PC, Verrier-Jones K, Jager KJ, Briggs JD (2004) Renal replacement therapy in children: data from 12 registries in Europe. Pediatr Nephrol 19:213–221

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ABSTRACTS

# Poster Session

## POSTER SESSION

### PS1-THU-006
### Behavior disorders and quality of life in children and adolescents with renal transplantation

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Medical advances have helped the majority of pediatric renal transplant patients to survive into adulthood, so the optimal care of these patients includes adequate Psychosocial development to achieve a successful transition to adulthood. An observational and descriptive study, and to determine the prevalence of behavioral disorders and quality of life in 41 renal transplant children and adolescents aged between 5 and 18. The measurement instrument was the survey.

**Nursing evaluation:** Good motivation on the part of the patient to follow the treatment, but the patient also feels exhausted by the chronic nature of it.

**Nutritional:** Percentage of patients with obesity and excess weight superior to that of the healthy population, with major predominance in the early post transplant (<6 months) and those that were receiving steroids. This associated with other factors as dyslipidemias, arterial hypertension and scarce physical activity increase the cardiovascular risk, therefore the evaluation and education pre and post transplant will help to prepare the co-morbid states.

**Educational:** A negative effect was stated in most areas of learning and school aspects, interfering with the acquisition of basic knowledge, more so the longer and more severe the base illness was pre transplant.

**Socio-familiar evaluation:** Illness situation increased the chance of labor loss of one of the progenitors in some cases. The principal needs perceived by the familial group were the need for major socio-familiar support, economic support, orientation and advice.

**Behavioral and emotional disorders:** High predominance of psychiatric disorders arose with co-morbidity, which highlights the need for paido-psichiatric evaluation pre and post transplant. The quality of life was significantly below average compared to the healthy population. Although with the age it improves in the patient, the evaluation on the part of the parents remains very negative.

### PS1-THU-007
### BK virus in pediatric kidney transplanted patients: incidence, diagnosis, therapy and outcome

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In our center 58 pediatrics patients received a kidney graft from 2006.5 patients (8.6%) had presented BK viremia positive. All patients transplanted were tested for BK Polyomavirus by PCR.

We found two patients with viremia positive without BKVAN. The appearance was between 3er month and 12th month. Another 3 patients presented BKVAN consequent upon their positive viremia appearing between 11th and 122 month. These 3 patients had been submitted to severe immunity suppression. The induction treatment in the current transplant has been with thymoglobulin/Steroids followed by standard immunosuppression. The BKVAN in these patients appeared for polyuria, proteinuria and decrease of glomerular filtration . The renal biopsy showed BKVAN grade B in two patients and C in the patient 1.

The both patients without nephropathy the treatment was reduction in immunosuppression: withdrawn MMF and reduced tacrolimus 50% of dose . Both patients had a good evolution with disappearance of BK in blood in 6 months. The 3 patients with BK nephropathy underwent the same immunosuppression and also plan have been treated with cidofovir, withdram of mycophenolate, FK reduction with levels of 4 ng/ml, in two of them and the third change low-dose everolimus.

The evolution of patients with nephropathy degree C evolved with the loss of the graft, both patients with grade B have evolved correctly with the negative viremia and normalization of renal function. The type B nephropathy may be reversible, while type C is irreversible. BKVAN is cause of irreversible graft failure.

We found that with reduction of immunosuppression, it's not enough for reduce the viral loads, and don't go to progression to BKVAN. The Cidofovir indication is clearly established when we have a BKVAN.

### PS1-THU-008
### Acylcarnitine profile in end-stage renal disease (ESRD) patients

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**Objective:** Patients with ESRD on regular hemodialysis (HD) frequently encounter carnitine depletion and accumulation of acylcarnitines (ACs). This study was carried out to investigate -the effects of l-carnitine supplementation on AC profile, -the dynamic response of distinct ACs during the single HD session in carnitine repleted state, and -the recovery pattern of ACs during the wash-out period.

**Methods:** 20 consecutive, non-diabetic adult patients with ESRD on HD for >6 months were selected for this longitudinal study. They received three HD sessions weekly and 1g iv l-carnitine after each session for 12 weeks. Samples were taken for free and ACs before, at the end of supplementation, and at hourly intervals during the first HD session

controlled BP's on antihypertensive therapy. The mean LVMI in hypertensive children before transplantation was 72.4 g/m2.7 and improved to 44.5 g/m2.7 after transplantation.
**Conclusions:** Severe hypertension was occured in the early period after renal transplantation. However, end-organ damage can be prevented with careful follow-up, early diagnosis and adequate antihypertensive therapy compared with the period prior to transplantation. In this situation, clinicians should be careful in terms of hypertension especially the first month after renal transplantation. As all patients had night-time hypertension, ABPM is required for diagnosis of hypertension in early post-transplantation period.

**PS1-THU-146**
**Effects on ultrafiltration failure of mesenchymal stem cell transplantation in chronic peritoneal dialysis rat model**

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**Backgraund:** Ultrafiltration failure continues to be a major complication of peritoneal dialysis(PD), particularly long-term PD because of hyperosmolar and acidic PD fluids and episodes of peritonitis. The purpose of this study was to investigate whether the healing effect on ultrafiltration failure of mesenchymal stem cell(MSC) transplantation in chronic peritoneal dialysis rat model.
**Methods:** Sixty-eight male wistar-albino rats were divided into two groups. Study group (n=60) received once-daily IP injection of 20 ml 3.86% glucose dialysis solution for 6 weeks and control group (n=8) did not receive any injection and peritoneal permeability was evaluated by peritoneal equlibrium test (PET) at the end of 6 week period. Then, study group divided three groups. PDgroup (n=8); PET was performed, MSCgroup (n=26): MSC's were administered IP injection dose of 1.5 million unit/kg and placebo(P) group (n=26):placebo were injected equal amount with MSC at the end of 6 weeks. PET was performed to MSC and P groups at the end of first week(n=8), second week(n=9) and third week (n=9), after receiving MSC and placebo.
**Results:** When compared with the control group, UF quantity significantly decreased in PD and P groups(P1-P2-P3) ($P<0.05$) but no difference between control group and MSCgroups(MSC1-MSC2-MSC-3). Rate of glucose transport was high in PD, P-2 and P-3 PD, P-2 and P-3 groups was lower than control group($P<0.05$). However, in MSC-2 and MSC-3groups D/D0glucose was higher and D/PCr was lower than PD, P-2 and P-3 groups ($P<0.05$).
**Conclusion:** PD group had high permeability UF failure. Our results showed that MSC transplantation has positive effects on ultrafiltration failure in chronic PD rat model. This is the first study, to our best information aimed to investigate effect on ultrafiltration failure of MSCs transplantation in chronic PD rat model. MSCs transplantation may be a hope for the renewal of the peritoneum in chronic PD patients with UF failure.

**PS1-THU-147**
**End-stage renal disease in Slovak children: epidemiology from a European perspective**

**G. Kolvek***[1,2], S. Reijneveld[3], L. Podracka[1,2], J. Rosenberger[2,4,5,6,], I. Nagyova[2,7], R. Stewart[3], J. van Dijk[2,3]

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**Objectives and study:** The aim of this study was to examine the occurrence of end-stage renal disease (ESRD) in Slovak children, to compare it with earlier Slovak data and with data from other European countries and to explore etiology.
**Methods:** Over the years 2003–2009 data on the incidence and prevalence of all cases of ESRD in children from all four Slovak tertiary pediatric centers were collected. The data were compared with two earlier Slovak studies and with European data from the European Society of Paediatric Nephrology.
**Results:** The median annual incidence rate of ESRD in Slovak children under 15 years of age was 6.6 per million age-related population (pmarp). The prevalence rate on 31st December 2009 was 24.1 pmarp. Compared with the last study (18.6 pmarp) the differences were not statistically significant. The comparison with neighboring countries and with the European average shows no significant difference in incidence, while prevalence is significantly lower compared to neighboring Austria, some other (mostly western) European countries as well as the European average. Etiology mainly concerned congenital anomalies (34.6%) and cystic diseases (19.2%).
**Conclusions:** During the past decade the incidence and prevalence rates of ESRD in Slovak children have remained stable. Compared to the European average the prevalence in Slovak children is significantly lower.

**PS1-THU-157**
**The use of rituximab in paediatric renal transplant recipients**

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**Objectives:** To review indication, treatment and outcomes with rituximab in paediatric renal transplant recipients (RTR).
**Method:** Retrospective analysis of all RTR receiving rituximab in a single renal transplant centre.
**Results:** 19 patients aged 5.7–17.5 (median 13.3) years(y) with 20 rituximab treatment episodes identified from 2002–11.
Five received rituximab at median 65 days with other treatments for post-transplant recurrence of focal and segmental glomerulosclerosis; three treated with a single dose of 750 mg/msq, one 2 doses and one given 4 weekly doses of 375 mg/msq. 60% responded (one with Stage V(T)-CKD, another requiring graft nephrectomy) with resolution of proteinuria and estimated glomerular filtration rates(eGFR) 20–76 mls/min/1.76 msq at 0.75–1.25 y post-transplantation. Six cases received rituximab for biopsy proven rejection with donor specific antibodies(DSA) at 0.04–12.5 (median 6.3)y post-transplant. Five patients have functioning grafts at 3.7–9.9 y from transplantation. Three patients received rituximab for rejection without DSA.
4 rituximab doses at 375 mg/msq were used to treat post-transplant lymphoproliferative disease (PTLD) in five cases presenting 0.5–7(median 0.8)y post-transplant. Two have resolution of disease at 0.8 and 1.3 y post diagnosis, one patient responded and transitioned to adult services. Two patients died; one had B-cell Burkitt phenotype non-Hodgkin\'s lymphoma receiving 2 doses rituximab before treatment withdrawn. The other had atypical HUS and developed PTLD 0.5 y post-transplant requiring