

In the Name of GOD



Shahid Beheshti
University of Medical Sciences

Research Affairs
Disease Registry Unit

REGISTRY PROPOSAL:

Outcome of Pediatric Patients with Recurrent Urinary Tract Infections

Masoumeh Mohkam, Professor of Pediatric Nephrology Department
Pediatric Nephrology Research Center, Research Institute for Children's Health,
Shahid Beheshti University of Medical Sciences, Tehran, Iran.

A. Brief Intro to Registry –Literature Review

Urinary tract infection (UTI) is one of the most important and common infections in pediatric group. In 30% of children with urinary tract anomalies, UTI can be the first sign [1]. If we fail to identify patients at risk, damage to the upper urinary tract may occur. Up to 85% of infants and children with febrile UTI have visible photon defects on technetium Tc 99–labelled dimercaptosuccinic acid (DMSA) scanning, and 10–40% of these children have permanent renal scarring [2], [3], [4] that may lead to poor renal growth, recurrent pyelonephritis, impaired glomerular function, early hypertension, end-stage renal disease, and preeclampsia [5], [6], [7], [8], [9], [10].

B. Registry Objectives (what is it you are specifically looking at, trying to reach?)

- **Main aim:** Outcome of the patients with recurrent urinary tract infection based on DMSA scan and GFR evaluation
- **Specific aims:** Clinical and paraclinical manifestation of recurrent urinary tract infection

C. Registry Design (participants, data collection, statistical analysis plan, etc.)

Pediatric this study is a cohort study on patients with recurrent UTI. Pediatric patients with documented UTI and will be examined with systemic inflammatory markers, renal ultrasonography, and voiding cystoureterography (VCUG). The excluding criteria are any evidence of renal insufficiency, previous known urological problems or intervention, hypertension, recent history of antibiotic taking, concurrent extrarenal infection. The evaluation would be complete blood count; C reactive protein (CRP); erythrocyte sedimentation rate (ESR); measurement of serum blood urea nitrogen, creatinine, and electrolyte levels; urinalysis; and urine culture. The diagnosis of UTI are in the following instances: any amount of gram-negative bacteria grown in urine cultures obtained through suprapubic aspiration, more than 10^4 colonies per milliliter of a single pathogen grown in urine cultures obtained through bladder catheterization, more than 10^5 colonies per milliliter of a single pathogen in urine cultures obtained through clean voiding or in patients with negative urine cultures, significant leukocyturia in febrile children with clinical signs and symptoms (fever, abdominal pain, anorexia, dysuria, and vomiting) and laboratory results in favor of UTI (leukocyte count >10000 per high-power field; $ESR > 20$ mm/h; and $CRP \geq 1+$). The diagnosis of pyelonephritis is documented by ^{99m}Tc -DMSA scintigraphy (evidence of decreased cortical uptake in each part of the kidneys). Glomerular filtration rate is calculated according to the Schwartz formula. Data are expressed as mean \pm standard deviation or frequency (percent), where appropriate. The SPSS software (Statistical Package for the Social Sciences, version 25, SPSS Inc, Chicago, Ill, USA) is used for statistical analyses. Findings are compared using the Mann-Whitney U test, Fisher exact test, and Pearson chi-square test, and the receiver operative characteristic (ROC) curve is used for analysis of diagnostic test values. Statistic tests are 2-tailed and consider significant when P value is less than .05.

D. Timeline for your Registry project (project deadlines set by you and your mentor)

The duration of registry for evaluation of early complications is about one year

E. Who will provide support and feedback and how often will this occur?

Dr Masoumeh Mohkam, pediatric nephrologist will provide support and feedback every 3 months.

References

1. J.B. Sastre, A.R. Aparicio, G.D. Cotallo, B.F. Colomer, M.C. Hernandez **Urinary tract infection in the newborn: clinical and radio imaging studies.** *Pediatr Nephrol*, 22 (2007), pp. 1735-1741.
2. B. Jakobsson, L. Svensson **Transient pyelonephritic changes on 99mTechnetium-dimercaptosuccinic acid scan for at least five months after infection.** *Acta Paediatr*, 86 (1997), pp. 803-807.
3. D. Benador, N. Benador, D. Slosman, B. Mermillod, E. Girardin **Are younger children at highest risk of renal sequelae after pyelonephritis?** *Lancet*, 349 (1997), pp. 17-19.
4. I.K. Hewitt, P. Zucchetta, L. Rigon, *et al.* **Early treatment of acute pyelonephritis in children fails to reduce renal scarring: data from the Italian Renal Infection Study Trials.** *Pediatrics*, 122 (2008), pp. 486-490. R. Fötter **Paediatric uro radiology**
5. A.L. Baert, K. Sartor (Eds.), *Medical radiology: diagnostic imaging*, Springer, Berlin, Germany (2001)
6. S.H. Sacks, K. Verrier Jones, R. Roberts, A.W. Asscher, J.G. Ledingham **Effect of symptomless bacteriuria in childhood on subsequent pregnancy** *Lancet*, 2 (1987), pp. 991-994.
7. S.H. Jacobson, O. Eklof, C.G. Eriksson, L.E. Lins, B. Tidgren, J. Winberg **Development of hypertension and uraemia after pyelonephritis in childhood: 27 year follow up.** *BMJ*, 299 (1989), pp. 703-706
8. J.M. Smellie, N.P. Prescod, P.J. Shaw, R.A. Risdon, T.N. Bryant **Childhood reflux and urinary infection: a follow-up of 10–41 years in 226 adults** *Pediatr Nephrol*, 12 (1998), pp. 727-736
9. J. Larcombe **Urinary tract infection** *Clin Evid*, 7 (2002), pp. 377-385
10. J. Round, A.C. Fitzgerald, C. Hulme, M. Lakhanpaul, K. Tullus **Urinary tract infections in children and the risk of ESRF.** *Acta Paediatr*, 101 (2012), pp. 278-282