



## Temporal Trend of Newly Diagnosed Incidence, Medical Utilization, and Costs for Pediatric Urolithiasis, 1998-2007: A Nationwide Population-based Study in Taiwan

Yuan-Hung Pong, Wei-Yi Huang, Yu-Chuan Lu, Vincent FS Tsai, Yu-Fen Chen, Hong-Chiang Chang, I-Ni Chiang, and Kuo-How Huang

<b>OBJECTIVE</b>	To investigate the trends of newly diagnosed incidence, medical utilization, and medical costs for pediatric urolithiasis in Taiwan.
<b>MATERIALS AND METHODS</b>	The present study uses the National Health Insurance Research Database, which contains the data of all medical benefit claims from the individuals enrolled in the national and single-payer insurance program in Taiwan. The National Health Insurance covered 22,717,053 enrollees, nearly 99% of Taiwan's population. Our analysis includes all subjects aged <18 years with a primary diagnosis of urolithiasis. We analyzed the temporal trend for annual newly diagnosed incidence, medical care visits, and medical costs for pediatric urolithiasis from 1998 to 2007.
<b>RESULTS</b>	A total of 1474 patients aged <18 years with newly diagnosed urolithiasis were identified, including 719 (48.8%) boys and 755 (51.2%) girls. The overall newly diagnosed rate of urolithiasis in pediatric population was 0.038% in 2007. The peak age stratum of urolithiasis occurrence in 2007 was 15-18 years. The trend of annual newly diagnosed incidences for boys, girls, and all children declined from 1998 to 2007. Furthermore, there were declining trends both in medical costs and annual medical care visits during the study period.
<b>CONCLUSION</b>	This is the first nationwide population-based study to indicate the declining trends in newly diagnosed rate, medical care visits, and medical costs for pediatric urolithiasis. These findings help to quantify and establish the burden of pediatric urolithiasis. These findings help to quantify and establish the burden of medical care for pediatric urolithiasis and to further refine the medical policy. UROLOGY 85: 216–220, 2015. © 2015 Elsevier Inc.

Urolithiasis is a common and important urologic disease. It is estimated that every year in the United States, 2 million clinic visits, >600,000 emergency room visits, and >177,000 hospitalizations are due to a primary diagnosis of urolithiasis, representing an annual expenditure of US \$2 billion.<sup>1,2</sup> Urolithiasis affects patients of all ages. Lifetime prevalence is reported to be 12%-15% in men and 6%-7% in women.<sup>3,4</sup> A number of previous studies have indicated

an increasing trend of stone frequency in the last quarter of the 20th century for both genders.<sup>3,5</sup> Increased detection of asymptomatic stones through use of current radiologic studies with improved sensitivity may explain, in part, this rise in prevalence.<sup>6</sup> The majority of related prior studies were based on patient-reported outcomes, hospital records, and health care organization databases.

However, the epidemiology of pediatric stones has not yet been well established. Although most of the previous studies showed an increasing prevalence for pediatric urolithiasis, similarly these studies were conducted by using regional hospital-based data.<sup>3,7-10</sup> Few population-based studies on the epidemiology of pediatric urolithiasis have been conducted.<sup>3,8,11</sup> In this study, we analyzed a single-payer, nationwide, population-based insurance database to investigate the temporal trend of pediatric urolithiasis in Taiwan during the period, 1998-2007.

Yuan-Hung Pong and Wei-Yi Huang contributed equally to the study.

**Financial Disclosure:** The authors declare that they have no relevant financial interests.

From the Department of Urology, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan; the Department of Urology, Ten-Chan Hospital, Taoyuan, Taiwan; and the Institute of Health and Welfare Policy, National Yang-Ming University, Taipei, Taiwan

Address correspondence to: Kuo-How Huang, M.D., Ph.D., Department of Urology, National Taiwan University Hospital, College of Medicine, National Taiwan University, #7 Chung-Shan South Road, Zhongzheng District, Taipei 100, Taiwan. E-mail: khhuang123@ntu.edu.tw

Submitted: July 25, 2014, accepted (with revisions): September 3, 2014

**Table 1.** The newly diagnosed incidence of pediatric urolithiasis in 2007

Age, y	Overall (%)	Boys (%)	Girls (%)	RR	95% CI	P Value
0-4	0.004 (2/45,459)	0.004 (1/23,617)	0.005 (1/21,842)	0.9248	0.0578-14.7801	.9559
5-9	0.009 (6/65,840)	0.012 (4/34,235)	0.006 (2/31,605)	1.8464	0.3382-10.0814	.4789
10-14	0.031 (22/71,340)	0.032 (12/37,012)	0.035 (10/34,418)	1.1159	0.4822-2.5825	.7978
15-18	0.127 (55/43,199)	0.125 (28/22,358)	0.130 (27/20,841)	0.9667	0.5699-1.6396	.8999

CI, confidence interval; RR, relative risk.

## MATERIALS AND METHODS

### Data Sources

**National Health Insurance Research Database.** The Taiwan National Health Insurance (NHI) Bureau has collected claim records covering all inpatient and outpatient medical benefit claims for nearly the entire population in Taiwan since the inception of its single-payer NHI program in 1995. As of 2007, NHI covered nearly 99% of the Taiwanese population (25.68 million). The entire data collection is known as the NHI Research Database (NHIRD). To assess the annual rate of medical care visits and medical costs for pediatric urolithiasis, we first identified subjects aged <18 years in the entire NHIRD, whose claims records included at least 1 diagnosis of urolithiasis (*International Classification of Diseases, Ninth Revision, Clinical Modification* codes 592.X and 274.11), forming the study sample.

**Annual Rate of Visiting Medical Care for Pediatric Urolithiasis.** We first determined the number of subjects from the study sample and categorized into 4 age strata (0-4, 5-9, 10-14, and 15-18 years) during each calendar year. To calculate the annual rate of visiting medical care for pediatric urolithiasis, the number was then divided by the Taiwanese population size in the 4 age strata in the corresponding calendar year.

**Medical Cost.** The medical cost of pediatric urolithiasis was calculated by claim records of all beneficiaries enrolled in NHIRD during the period, 1998-2007, including all diagnosis- and treatment-related costs at inpatient, outpatient, emergency, and ambulatory services associated with the diagnosis of pediatric urolithiasis.

**Longitudinal Health Insurance Database 2005.** The present study also uses a subset of NHIRD known as the Longitudinal Health Insurance Database 2005, which contains all inpatient and outpatient medical benefit claims for 1998 through 2007, for a sample of 1 million beneficiaries randomly drawn from the 25.68 million individuals in the NHI registry of beneficiaries as of 2007 (individuals enrolled for all or any part of the year 2005). The 1 million deidentified individuals included in Longitudinal Health Insurance Database 2005 provide a good statistical representation of the entire population of Taiwan.

**Newly Diagnosed Rate for Pediatric Urolithiasis.** Our analysis proceeds on a year-by-year basis for each calendar year from 1998 to 2008. We first selected all subjects who had not passed their 18th birthday as of December 31 of that year. Then, those subjects whose claims record included newly diagnosed urolithiasis. To minimize the effects of coding errors in diagnosis, we kept only those whose claims records included the additional diagnostic codes for radiologic imaging, ultrasonography, and urinalysis. The newly diagnosed rate for pediatric urolithiasis in 2007 was defined as the newly diagnosed stone event in an individual from our study sample in 2007. We excluded those who had prior claim records of urolithiasis from 1997 through

2006. The denominator was calculated by using all pediatric subjects who were aged <18 years on or before December 31, 2007.

### Statistical Analysis

Statistical analyses were performed using SAS software, version 9.1 (SAS Institute Inc, Cary, NC). Continuous data were expressed as mean  $\pm$  standard deviation. Percentages were calculated for categorical variables. The temporal trend for newly diagnosed rate, rate of medical care visits, and medical costs for pediatric urolithiasis from 1998 to 2007 were analyzed by linear regression. A *P* value of  $\leq .05$  was considered to be statistically significant.

## RESULTS

The newly diagnosed incidence of pediatric urolithiasis categorized by sex and age in 2007 is listed in [Table 1](#). There were a total of 1474 subjects in the 10 annual panels for the years 1998-2007, including 719 (48.8%) boys and 755 (51.2%) girls. In 2007, 85 pediatric subjects had newly diagnosed urolithiasis. Among them, urolithiasis was diagnosed at outpatient clinics in 71 children, approximately 83.5% of subjects; at the emergency department in 5 children (5.9%); and during inpatient hospitalization in 9 children (10.6%).

[Table 1](#) lists the newly diagnosed incidence of urolithiasis in 2007. The overall newly diagnosed incidence of urolithiasis in all pediatric population was 0.038%. Male subjects had a greater newly diagnosed incidence of pediatric urolithiasis between 5 and 9 years. Otherwise, the differences in the newly diagnosed incidence between sexes were not statistically significant in other age strata. The peak age stratum of pediatric stone occurrence was 15-18 years (64.7%), followed by 10-14 years (25.9%) in 2007.

The trend of annual newly diagnosed incidence of pediatric urolithiasis in all subjects is shown in [Figure 1](#). There are significant declining trends of newly diagnosed urolithiasis in all subjects ( $r^2 = 0.8946$ ;  $P < .0001$ ), boys ( $r^2 = 0.6376$ ;  $P < .0024$ ) as well as girls ( $r^2 = 0.9345$ ;  $P < .0001$ ).

Similarly, as is shown in [Figure 2](#), there were also significantly declining trends in medical costs of pediatric urolithiasis during the period, 1998-2007 ( $r^2 = 0.9403$ ;  $P < .0001$ ). The annual medical costs for pediatric stone decreased by 49.9% from US \$8.53 million in 1998 to US \$4.27 million in 2007.

In terms of the annual medical care visits, a declining trend during the study period also existed ( $r^2 = 0.9784$ ;  $P < .0001$ ; [Fig. 3](#)). The annual medical care visits

Download English Version:

<https://daneshyari.com/en/article/3899059>

Download Persian Version:

<https://daneshyari.com/article/3899059>

[Daneshyari.com](https://daneshyari.com)