Clinical and Pathological Analysis of Nephritis in Children

Li Qiu

BinZhou Polytechnic, Binzhou, 256603, China

Keywords: Childhood Diseases, Clinical Cases, Nephritis Pathology, Retrospective Analysis

Abstract: This article mainly focuses on the clinical and pathological analysis of children with nephritis. The purpose is to provide a diagnostic basis for children with nephritis. The method is to select clinical cases and related examination pathologies from the Children's Hospital of this city, conduct a retrospective analysis on them, and classify these cases according to age after grouping, it was found that children with nephritis mainly occurred between 7 and 13 years old, and there were 25 cases in total, and children under 3 years old were the least. After analyzing the clinical manifestations of these children, it was found that 43 cases of childhood nephritis mainly showed edema, and then gastrointestinal diseases, 26 cases appeared. According to this, it can be used as the basis for some clinical judgments of doctors. The pathological analysis of children with nephritis, the first is the urine routine; there are 24 cases of proteinuria, and 42 cases of renal damage.

1. Introductions

Childhood nephritis is one of the common pediatric diseases, and it is also a key factor affecting the long-term quality of life of children [1-2]. It is very important to clarify the type of kidney pathology and choose the corresponding treatment plan. For now, kidney biopsy is still the gold standard for identifying pathological types [3-4]. However, due to its invasive operation, difficult cooperation for children, and high technical requirements, kidney biopsy for children cannot be carried out in many district and county-level hospitals [5-6]. To this end, this article will focus on exploring some of the superficial symptoms of childhood nephritis and some pathological manifestations, providing some ideas for the diagnosis of childhood nephritis, helping children with nephritis can be diagnosed and treated in time, so as to reduce the cases of missed treatment of children with nephritis that are not diagnosed in time by Tingwei [7-8].

Regarding clinical and pathological studies of children's nephritis, some researchers found that 53% of proteinuria was between 1 and 3 through the medical data and related biological data of purpura nephritis at the Children's Kidney Center from 1995 to 2015. 18% of children's urine routine test urine protein is less than 1, and then 47% of children in the treatment plan only receive oral steroids, and 37% of patients only receive methylprednisolone pulses, and then take oral steroids [9]. There are also researchers who compared the two diseases of Henoch-Schonlein purpura nephritis and immunoglobulin a nephropathy. By taking kidney biopsy on 100 patients and observing them with an optical microscope, they obtained the development of renal tubulointerstitial fibrosis. And its relationship with the expression of transforming growth factor β1 and monocyte chemoattractant protein 1 [10]. Researchers have also conducted research on the clinical and prognosis of Henoch-Schonlein purpura nephritis. By collecting clinical children's cases in Kragujevac from 2011 to 2012, as well as experimental parameters and prognostic data of HSP, it is found that most children with this disease have symptoms Arthritis, abdominal pain, accompanied by traces of hematuria [11]. Some researchers have also suggested that the classification of Henoch-Schonlein Purpura Nephritis (HSPN) is not completely related to the clinical manifestations and long-term prognosis of the disease. The children diagnosed as (HSPN) cases by the Children's Kidney International Center from 2003 to 2015 as well as the prognosis analysis, 104 10-year-old patients with mesangial cell hyperplasia (M1) are closely related to proteinuria [12].

This article analyzes the clinical manifestations and pathology of childhood nephritis. First, it summarizes the symptoms of gastric nephritis based on relevant literature data, and then analyzes

the pathology of each subdivision of childhood nephritis for correlation analysis. The theoretical foundation has been prepared by collecting clinical cases and biological data of children diagnosed with nephritis in the Children's Hospital of this city, and then using statistical software to analyze and classify these data, and draw relevant conclusions.

2. Clinical and Pathological Research on Childhood Nephritis

2.1 Nephritis in Children

(1) Tonsillitis, redness of the skin and some threatened infections usually occur in the early stage of the disease. Then some symptoms such as low-grade fever, dizziness, nausea, vomiting, loss of appetite and so on appeared. These conditions are no different from ordinary fevers and infections. They cannot attract people's attention and are often ignored. Edema and oliguria are signs of this disease. At the beginning, the edema starts from the child's eyes and face, gradually spreads to the whole body and then to hoarseness. When the swelling occurs, the urine output is significantly reduced, or even anuria. The urine output gradually increases to about 1-2 weeks, and the swelling gradually subsides. The hematuria of most children is invisible to the naked eye, and only a few children can directly see the hematuria with the naked eye. People think that the color of hematuria is as fresh as the water used to clean meat drinks, and some people think it is like strong tea. It will be related to the pH of urine. We hope that parents should pay special attention to the process of carefully observing their children's urine. Normally, the hematuria visible to the naked eye will disappear completely within 1 to 2 weeks. The clinical symptoms of children with hypertension are mainly nausea, vomiting and dizziness, but if the weight gains and the blood pressure is too high, the patient will have many serious complications.

2.2 Pathology of Nephritis in Children

(1) Chronic interstitial nephritis

Comparison of the urine protein content in the pathological urine routine examination of chronic interstitial nephritis. The normal content of urine protein is less than 1.5 g/24h. There are also urine examinations that the sugar content is too high and the amino acid content is too high, and electrolytes are often present disorders and metabolic acidosis. If there is a urinary tract infection, the urine routine may contain more white blood cells and other white blood cell casts. The function of glomerular filtration is normal, but many patients have reduced glomerular filtration function to varying degrees when they see a doctor.

Imaging (b-ultrasound, x-ray, radionuclide, etc) can show normal or decreased kidney function. The main signs of renal biopsy are various degrees of interstitial fibrosis, renal tubular atrophy, diffuse interstitial lymphocytes and monocyte infiltration. Some patients found that some cases were due to intramuscular atherosclerosis, stenosis of the lumen, and ischemic atrophy and sclerosis of the spinal cord.

(2) Acute interstitial nephritis

Urine abnormalities include high molecular weight hematuria, white blood cell urine, and proteinuria (low molecular weight proteinuria, high molecular weight proteinuria). Leukocyte urine is generally sterile white blood cell urine, and sometimes we can also find eosinophils and occasionally white blood cell extracts in the urine. It is often accompanied by obvious renal tubular function impairment, renal diabetes, hypotonic urine, and sometimes accompanied by peripheral or renal tubular acidosis, occasionally fanconi syndrome (diabetes, amino aciduria, phosphateemia, urinary nettle, measles, etc).

(3) Chronic glomerulonephritis

The main manifestations of urine routine examination are (proteinuria, hematuria, tubular urine), and the symptoms include edema and hypertension for more than one year. In addition to secondary glomerulonephritis and hereditary nephritis, regardless of whether there is renal dysfunction, it should be considered after glomerulonephritis, and chronic nephritis can be diagnosed clinically.

(4) Acute glomerulonephritis

Under a light microscope, endothelial cells and mesangial cells proliferated diffusely, and neutrophils penetrated. Immunofluorescence showed that IgG and C3 were coarse-grained, deposited along the capillary wall and interstitial area, and compact electron deposition.

(5) Idiopathic acute tubulointerstitial nephritis

Visible extra-intestinal invasive lymphocytes, plasma cells, eosinophils, interstitial immunoglobulin deposition and IgE and C3 particle deposition in the tube.

(6) Hepatitis B virus-related nephritis

Under light microscope observation, it can be found that the diffuse glomerular basement membrane thickens and spikes. The thickened basement membrane often presents a chain ring shape, and is accompanied by obvious in vitro mesangial cells and matrix proliferation. The thickened basement membrane often presents a chain ring, and is accompanied by obvious interbody membrane cell and matrix proliferation; in addition to igg and c3 showing tiny particle-like deposits, immunofluorescence examinations often only have igm, iga, and c1q, etc. Microparticles are deposited on the capillary wall and glandular membrane area; when observed under the electron microscope, we found that large electronic compact objects are distributed in multiple locations, found in the subepithelial, intrabasement membrane, subendothelial and joint membrane areas.

3. Clinical and Pathological Analysis of Childhood Nephritis

3.1 Data Collection

Through the search of the case database of the Children's Hospital of this city, the pathology of children with nephritis and related examination data sheets from 2017 to 2020 are collected, re-check the relevant medical records, and classify and grade the pathology, and then collect the clinical data of the patients and analyze their correlation. Mainly count the patient's age, gender, blood routine examination, urine routine examination, renal function examination, glomerular filtration rate and so on.

3.2 Evaluation Criteria

It is mainly based on the basic data of the patient to make a classification: mainly including the age, gender, and course of the patient.

(1) Age division of patients: divide the age of patients into four categories. According to different ages, they can be divided into infants (1-2), preschool (2-7), school age (7-13), and adolescence (13-18).

(2) Course of disease: the time from onset to diagnosis.

(3) Clinical symptoms: Refers to the symptoms shown at the onset of the disease, as well as the data in the relevant blood routine examinations, and the urine routine data.

3.3 Clinical Diagnosis of Nephritis

(1) Chronic interstitial nephritis (A)
(2) Acute interstitial nephritis (B)
(3) Chronic glomerulonephritis (C)
(4) Acute glomerulonephritis (D)
(5) Idiopathic acute tubulointerstitial nephritis (E)
(6) Hepatitis B virus-related nephritis (F)

3.4 Statistical Analysis

The collected data needs to be processed. For example, some data is incomplete and needs to be deleted. Then the statistical software SPSS is used to analyze the data. The software analysis is mainly for normal distribution analysis, and the related data processing is for average and to find the standard deviation of the data, the correlation between the two sets of data is tested by t, the comparison of multiple sets of data is tested by the variance of the data, and the non-normal distribution is represented by the median. According to the correlation evaluation standard, P less

than 0.05 has statistical significance.

$$t = \frac{S^2 xy}{Sx\ Sy} = \frac{\sum(x - \bar{x})(y - \bar{y})/n}{\sqrt{\sum(x - \bar{x})^2/n}\sqrt{\sum(y - \bar{y})^2/n}} \quad (1)$$

$$t = \frac{n\sum xy - \sum x \sum y}{\sqrt{n\sum x^2 - (\sum \bar{x})^2}\sqrt{(n\sum y^2 - (\sum \bar{y})^2)}} \quad (2)$$

4. Analysis of Clinical and Pathological Results of Nephritis

4.1 Statistics of the Proportion of Patients by Age

By sorting out the clinical data in the case database of the Children's Hospital of this city, using statistical software to classify the ages of patients according to the above classification criteria, the relevant data results are shown in Table 1:

Table 1. Statistics of the proportion of patients by age

	1-2 years	2-7 years	7-13 years	13-18 years
A	2	6	5	3
B	4	4	6	4
C	2	3	7	6
D	3	7	8	7
E	0	3	4	3
F	1	2	3	2
total	12	25	43	25

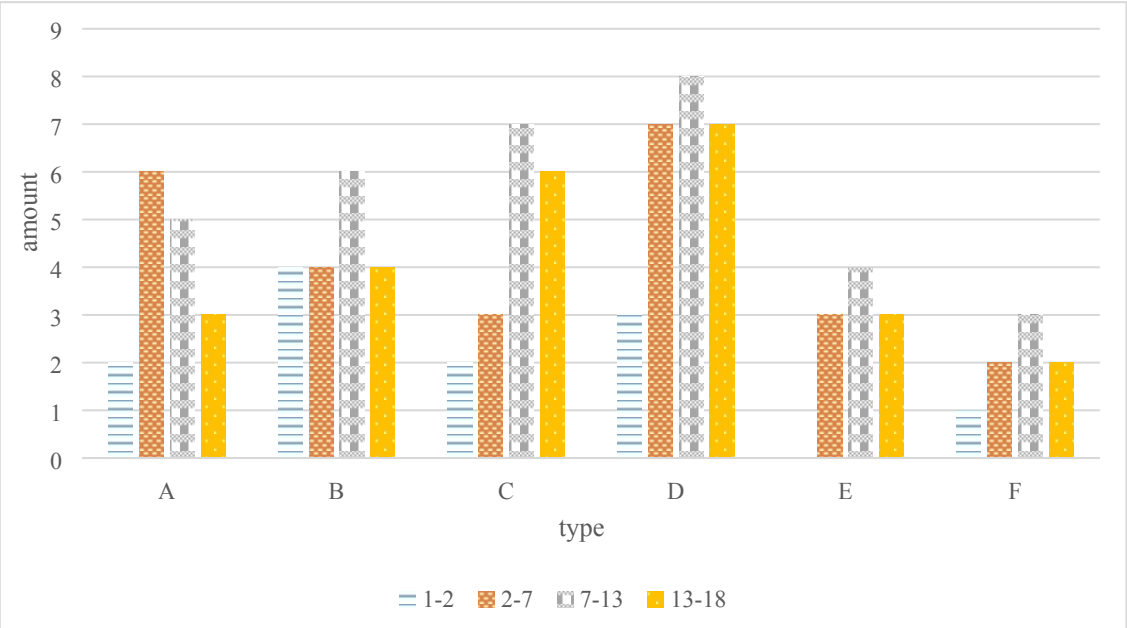

Figure 1. Statistics of the proportion of patients by age

It can be seen from Figure 2 that the clinical manifestations of childhood nephritis are mainly edema and gastrointestinal diseases. There are 42 cases of edema, 10 cases of gastrointestinal discomfort, accounting for more than 50%, and gastrointestinal diseases. The disease is mainly due to nephritis. Most of the disease is due to viral infection. The symptoms of edema are mainly due to damage to the kidney organs.

4.2 Analysis of Clinical Manifestations of Nephritis

Through the collation of the clinical data of the Children's Hospital of this city, the clinical manifestations of children with nephritis are statistically analyzed. The relevant data results are

shown in Table 2:

Table 2. Analysis of clinical manifestations of nephritis

	Stomach	Decreased urine output	Edema	Joint
A	1	6	4	4
B	4	5	6	4
C	2	3	7	6
D	3	7	8	7
E	0	3	4	3
F	1	2	3	2

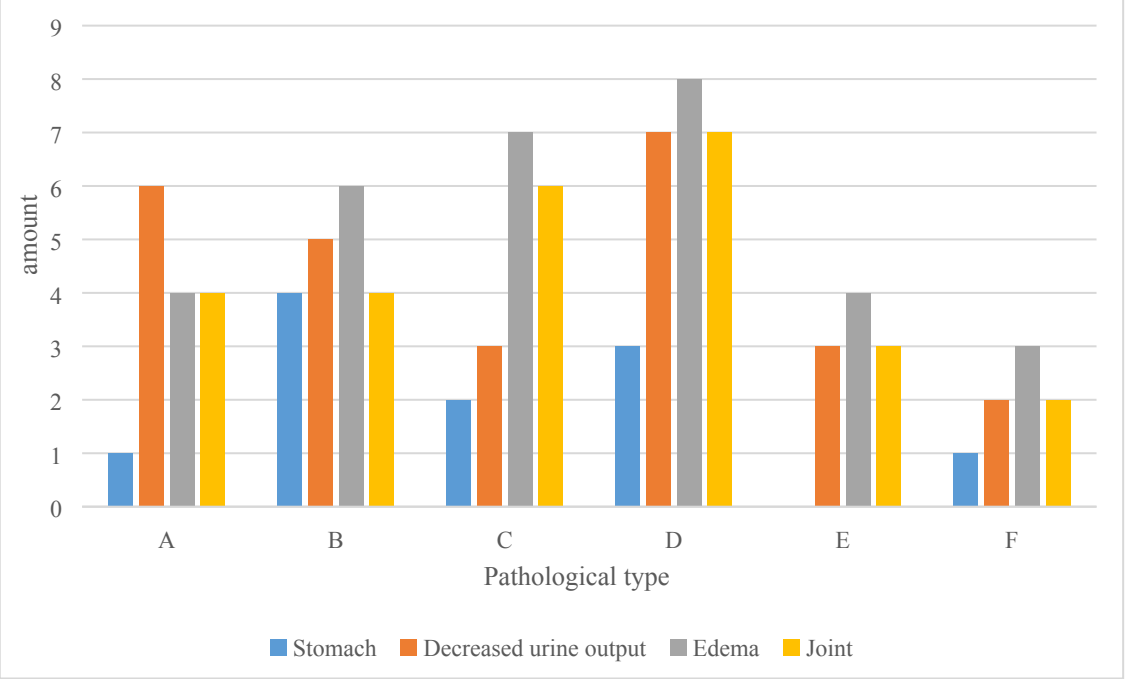

Figure 2. Analysis of clinical manifestations of nephritis

It can be seen from Figure 2 that the clinical manifestations of nephritis in children are mainly edema and gastrointestinal diseases, which account for more than 50%. The gastrointestinal diseases are mainly due to nephritis. Most of the nephritis is due to viral infection and edema. The disease is mainly due to damage to the kidney organs.

4.3 Pathological Analysis of Nephritis

Through the collation of the clinical data of the Children's Hospital of this city, a statistical analysis of the pathology of children's nephritis is carried out. The relevant data results are shown in Table 3:

Table 3. Pathological analysis of nephritis

	Renal tubules	Urine protein	Hematuria	Glomerulus
A	1	6	4	4
B	2	7	8	2
C	1	4	9	4
D	3	7	8	7
E	0	3	4	3
F	1	2	3	2

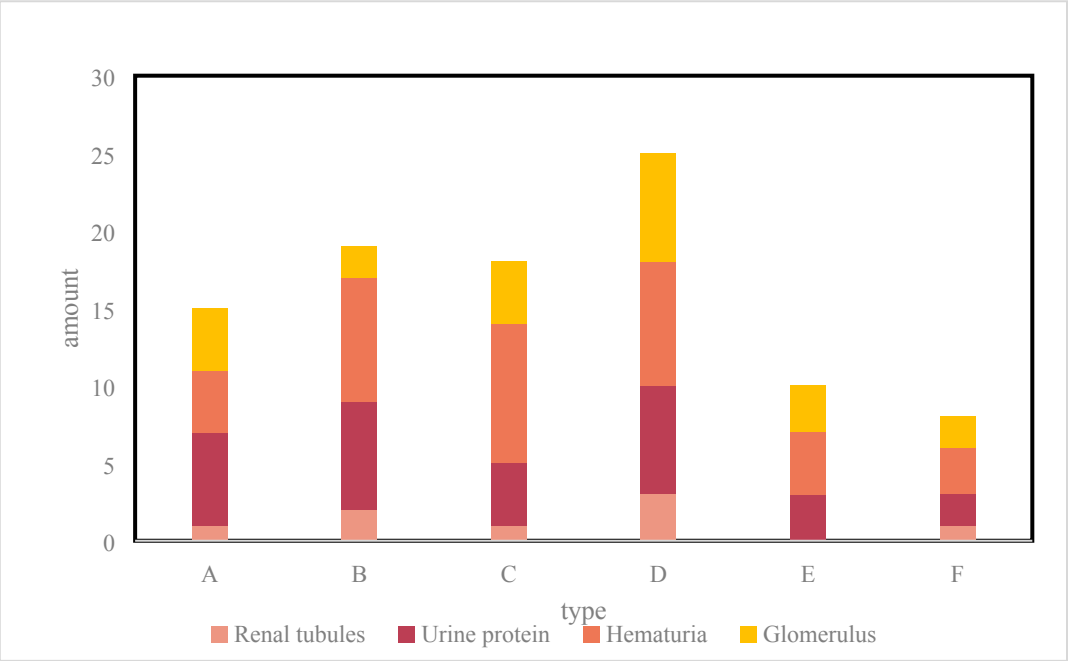

Figure 3. Pathological analysis of nephritis

It can be seen from Figure 3 that the pathology of childhood nephritis is mainly urine protein in the urine routine. If it exceeds the normal range, it can be judged that there is a problem with the kidney organs.

5. Conclusions

This article analyzes the clinical cases and diseases of children with nephritis, and concludes that the older children with nephritis are mainly concentrated in the 7-13 years old, and then the clinical manifestations are edema, gastrointestinal discomfort, and abdominal pain, which are mainly due to large part of childhood nephritis is caused by a viral infection, and the pathological manifestations are abnormal proteinuria in the urine routine examination, and some hematuria may also occur. In the research process of this article, there are still some research deficiencies, mainly due to insufficient data, and no specific children's pathological data are displayed. It is just a general summary. In future research, we will continue to diligently research in this area to make the research results more persuasive.

References

[1] Delbet J D, Hogan J, Aoun B, et al. Clinical outcomes in children with Henoch–Schönlein purpura nephritis without crescents[J]. Pediatric Nephrology, 2017, 32(7):1-7.

[2] Mao S J, Huang X M. Tripterygium wilfordii Hook F is efficacious in the treatment of Henoch-Schnlein purpura nephritis in children [J]. World Journal of Pediatrics, 2016, 12(3):375-376.

[3] Jaiben G, Sankaramangalam K P, Aditi S, et al. Lupus Nephritis in Indian Children: Flares and Refractory Illness [J]. Indian pediatrics, 2018, 55(6):478-481.

[4] Scobell R, Pradhan M. Management of Lupus Nephritis in Children[J]. Indian pediatrics, 2020, 57(5):401-406.

[5] Zhao, Zhang, Hao, et al. PP-47 Off-label use of tacrolimus in children with henoch-schonlein purpura nephritis: efficacy and safety [J]. Archives of Disease in Childhood, 2017, 102(10):A42.3-A43.

[6] Yang B, Tan X, Xiao X, et al. Effect of CD40/CD40L signaling on IL-10-producing regulatory B cells in Chinese children with Henoch-Schönlein purpura nephritis[J]. Immunologic Research,

2016, 65(3):1-13.

[7] Chan Y H. Long-term outcomes with multi-targeted immunosuppressive protocol in children with severe proliferative lupus nephritis [J]. Lupus, 2016, 25(4):399-406.

[8] Fu H, Mao J, Xu Y, et al. Clinical features and outcomes of diffuse endocapillary proliferation Henoch-Schönlein purpura nephritis in children [J]. Clinics, 2016, 71(9):550-554.

[9] Sultana A, Afroze S, Hanif M, et al. Immunoglobulin A Vasculitis Nephritis in Children: Experience from a Tertiary Care Hospital, Bangladesh [J]. Pediatric Nephrology, 2021, 9(1):1-7.

[10] Stephens C, Conlon T A, Waldron M. A retrospective study of management of Henoch Schonlein Purpura nephritis in children in Ireland [J]. Archives of Disease in Childhood, 2019, 104(3):376-377.

[11] Li X, Tang M, Yao X, et al. A clinicopathological comparison between IgA nephropathy and Henoch–Schönlein purpura nephritis in children: use of the Oxford classification [J]. Clinical and Experimental Nephrology, 2019, 23(12):1382-1390.

[12] Namgoong M. Management of IgA vasculitis nephritis (Henoch-Schonlein purpura nephritis) in Children [J]. Childhood Kidney Diseases, 2020, 24(1):1-13.