

# Henoch-Schonlein purpura in children

## *Influence of age on the incidence of nephritis and arthritis*

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### ABSTRACT

**الهدف:** تمت هذه الدراسة لتقييم المظاهر الديديموغرافية و السريرية والنتائج المخبرية في الأطفال الأردنيين المقيمين في الأردن و المصابين بفرقرية هينوك - شونلاين. و أيضا دراسة تأثير عمر المرضى على معدلات حدوث التهاب الكلى و التهاب المفاصل.

**الطريقة:** تم دراسة الملفات الطبية للأطفال المصابين بفرقرية هينوك - شونلاين و الذين أدخلوا إلى مستشفى الأميرة رحمة للأطفال من أول سبتمبر 1997م إلى نهاية ديسمبر 2006م و إلى جناح الأطفال في مستشفى الملك عبد الله الجامعي من أول أغسطس 2005م إلى نهاية ديسمبر 2006م. و هذان المستشفيات يقعان في شمال الأردن و قمنا بتحليل المظاهر الديديموغرافية و السريرية و النتائج المخبرية لهؤلاء المرضى.

**النتائج:** تضمنت المظاهر السريرية ظهور الفرقرية في 100% من المرضى (68) مريض و التهاب المفاصل في 75% و التهاب الكلى في 29% من المرضى. معدل حدوث التهاب الكلى تغير حسب عمر المرضى. و قد حدثت في 19% من الأطفال الذين هم دون الخمسة سنوات و في 67% من الأطفال الذين هم فوق العشر سنوات. كان التهاب الكلى من النوع الخفيف في جميع المرضى. و تغير معدل حدوث التهاب المفاصل أيضا حسب عمر المرضى. و حدث في 56% من الأطفال الذين هم دون الخمس سنوات، و في 89% من الأطفال فوق العشر سنوات.

**خاتمة:** معدل حدوث التهاب الكلى و المفاصل في الأطفال المصابين بفرقرية هينوك - شونلاين له علاقة بعمر المريض. معدل حدوث التهاب الكلى و المفاصل قليل نسبيا في الأطفال الصغار و معدل حدوثهما أكثر في الأطفال الكبار، و التهاب الكلى من النوع الخفيف في جميع الأعمار.

**Objectives:** To assess the epidemiological, clinical, and laboratory findings in children affected with Henoch-Schonlein purpura (HSP), and to analyze the influence of age on the incidence of nephritis and arthritis.

**Methods:** This is a retrospective study of the case records of all patients admitted to Prince Rahmah

Hospital, Irbid, Jordan with HSP from September 1997 to December 2006, and to King Abdullah University Hospital, Irbid, Jordan from August 2005 to December 2006.

**Results:** The clinical manifestations included purpura in 100% of the 68 patients, arthritis in 75%, and nephritis in 29%. The incidence of nephritis varied according to the age of patients. It occurred in 19% of children less than 5 years of age, and in 67% of children 10 years of age and above. Henoch-Schonlein purpura nephritis was mild in all age groups. The incidence of arthritis also varied according to the age of patients. Arthritis occurred in 56% of children less than 5 years of age, and in 89% of children 10 years of age and above.

**Conclusion:** The incidence of nephritis and arthritis in children affected with HSP is age related. Older children have a higher incidence of nephritis and arthritis, while younger children have a lower incidence of nephritis and arthritis. Renal involvement was mild during the acute phase of the disease in all age groups.

*Saudi Med J 2008; Vol. 29 (4): 549-552*

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*Received 21st October 2007. Accepted 18th February 2008.*

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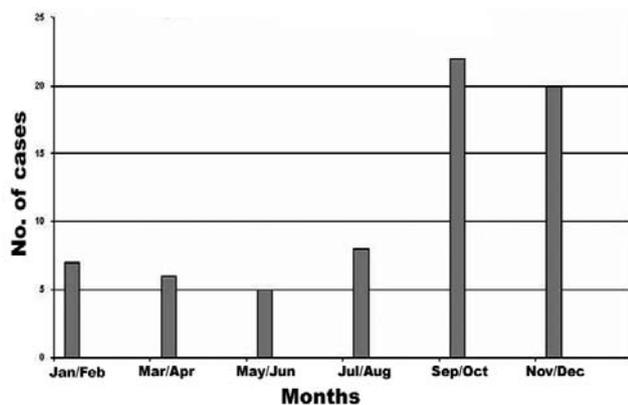
**H**enoch-Schonlein purpura (HSP) is an Immunoglobulin-A mediated vasculitis, and it is the most common vasculitic syndrome in childhood. It was first described in 1801 by Heberden<sup>1</sup> who reported a child with joint pain, abdominal pain, vomiting, bloody stools, and hematuria. In 1837, Schonlein described the condition that he called peliosis rheumatica, in

which arthralgia was associated with purpura. In 1899, Henoch<sup>2</sup> reported renal involvement as an important complication of this syndrome.<sup>3</sup> Reports of the influence of age on incidence of nephritis and arthritis in childhood HSP are rare in the English language literature.<sup>4</sup> The aim of this retrospective study is to examine the clinical profile of children affected with HSP, to analyze the influence of age on incidence of nephritis and arthritis, and to demonstrate that the clinical manifestations of HSP are influenced by the age of patients.

**Methods.** This is a retrospective study of the case records of all patients with HSP admitted to Prince Rahmah Hospital from December 2006 to September 1997, and to King Abdullah University Hospital, Irbid, Jordan from August 2005 to December 2006. In all cases, our diagnoses of HSP was based on the American College of Rheumatology criteria,<sup>5</sup> that is; each child had to have non-thrombocytopenic purpura along with one or more of the following: arthritis, abdominal pain, gastrointestinal bleeding, or nephritis. Arthritis was defined as swelling of the joints, or painful periarticular soft tissue edema. Nephritis was defined as the presence of gross or microscopic hematuria (5 or more red blood cells/high power field) with or without proteinuria. Gastrointestinal bleeding was defined as passage of grossly bloody stool, melena, or positive test for occult blood in stool. The study was approved by the medical ethics committee at King Abdullah University Hospital. The data were collected by reviewing the charts of the patients by one of the authors.

Data of incidence of arthritis and nephritis in different age groups was entered and analyzed in Epi Infoversion-6. Chi-square test was used. A *p*-value less than 0.05 was considered statistically significant.

**Results. Epidemiology.** Sixty-eight definite pediatric cases of HSP were included in this study, and all of



**Figure 1** - Seasonal distribution of Henoch-Schonlein purpura in children.

them were Jordanian children living in the northern part of the country. They were composed of 40 boys (59%) and 28 girls (41%). Males were affected more often than females (ratio M:F=1.4:1). The age at onset ranged between 16 months and 13 years, with a mean age of 5.9 years. Sixteen patients (24%) were less than 5 years old, 43 patients (63%) were aged between 5-9 years, and 9 patients (13%) were aged 10 years and above. Forty-two patients (62%) were admitted from September to December 2006 (**Figure 1**).

**Clinical features.** The main clinical manifestations of the 68 patients are shown in **Table 1**. All patients had non-thrombocytopenic purpura during the course of the disease. In all cases, the purpuric lesions were concentrated on the buttocks, and extensor surfaces of lower extremities. Arthritis was common, and it occurred in 51 patients (75%) (**Table 2**). Fifty patients had arthritis involving the joints of the lower extremities (feet, ankles, knees, or combinations of these joints). Eleven of the 51 patients had involvement of the hands, wrists, or elbows in addition to arthritis involving joints of the lower extremities. Thirty-nine of the 51 patients had arthritis, which was limited to the lower extremities. One child had arthritis limited to the upper extremities. Forty-three patients (63%) suffered abdominal pain,

**Table 1** - Clinical features in 68 children with HSP.

Clinical feature	n (%)
Purpura	68 (100)
Arthritis	51 (75)
Abdominal pain	43 (63)
Gross GI bleeding	2 (3)
Nephritis	20 (29)
Scrotal edema	5 (13)
Scalp edema	3 (4)
Recurrence	14 (21)

HSP - Henoch-Schonlein purpura,  
GI - gastrointestinal

**Table 2** - Incidence of arthritis and nephritis in different pediatric age groups.

Age group	N	Incidence of arthritis		Incidence of nephritis	
		n (%)	n (%)	n (%)	n (%)
<5 years	16	9 (56)	3 (19)		
5-9 years	43	34 (79)	11 (26)		
>10 years	9	8 (89)	6 (67)		
<i>P</i> -value	-	0.045	0.0005		

and 19 patients (28%) had gastrointestinal bleeding in addition to abdominal pain. The bleeding was occult in 17 patients, and 2 patients had grossly bloody stool. None of the patients had confirmed intussusception. Twenty patients (29%) had mild nephritis manifested as isolated microscopic hematuria in 14 patients, which was associated with mild proteinuria in 6 patients. None of these patients had gross hematuria. None of the patients had abnormal renal function tests. Only 3 patients continued to have microscopic hematuria that resolved over a few months. The incidence of arthritis and nephritis in different pediatric age groups is statistically significant (**Table 2**). Edema was noticed in 8 patients (12%), which was in the scalp in 3 patients (4%). Five boys from 40 (13%) had scrotal edema.

**Recurrences.** Fourteen patients (21%) had experienced one or more recurrences of their signs and symptoms. A recurrence was defined as reappearance of the rash following resolution of the disease for at least 2 weeks. The recurrences occurred over a time span ranging from 2 weeks to 3 years. The number of recurrences ranged from 1-3.

**Laboratory abnormalities.** Thirteen patients (19%) had anemia (hemoglobin less than 11 gm/dl). Thirty-seven patients (54%) had leukocytosis (white blood cell count more than 10,000/mm<sup>3</sup>). Sixteen patients (24%) had thrombocytosis (platelet count more than 400,000 mm<sup>3</sup>). Seventeen (85%) of 20 patients tested had elevated erythrocyte sedimentation rate (ESR) (value more than 20 mm/hr). Antistreptolysin O (ASO) titers, measured in 13 patients was abnormally elevated in 10 patients (77%). Fourteen patients (21%) had isolated microscopic hematuria, and 6 patients (9%) had microscopic hematuria associated with mild proteinuria. All patients had normal kidney function tests. Seventeen (26%) patients had positive fecal occult blood.

**Treatment.** Thirty-four patients (50%) received corticosteroids for the treatment of abdominal pain, and 18 patients (26%) received nonsteroidal antiinflammatory drugs to manage arthritis.

**Discussion.** Henoch-Schonlein purpura is a systemic vasculitis involving the small blood vessels of skin, joints, intestine, and kidneys. It is the most common cause of nonthrombocytopenic purpura in children. It has been reported in all age groups; age range 6 months-86 years,<sup>6-8</sup> however, the vast majority of cases occurs most frequently between the ages of 5-15 years, with the mean age of approximately 5-6 years. In the present study, the patients ranged in age from 16 months-13 years with a mean age of 5.9 years, which is similar to most published series.<sup>8-9</sup> In our

study, 59% of the children were boys, and 41% of the children were girls. With a M:F ratio of 1.4:1, and this ratio is similar to results of other studies.<sup>3-10</sup> Two thirds of the cases of HSP occurred during the months of September-December. This aggregation during the fall and early winter, might be explained by an increase in upper respiratory infections during these months. The history of preceding upper respiratory infection in 29 patients (43%), suggests the role of infectious triggers in pathogenesis of HSP. Of all the pathogens linked to HSP, beta-hemolytic streptococcus group has been the most extensively studied.<sup>11-12</sup> al-Sheyyab et al<sup>13</sup> reported that 49% of all patients in their study had elevated ASO titers compared to 16% of the control. In our study, elevated ASO titers occurred in 10 patients (77%) of 13 patients in whom the titers were measured. These findings support a role of antecedent streptococcal infection in the pathogenesis of HSP. Other organisms have been implicated in the etiology of HSP. These include hepatitis B virus, adenovirus, mycoplasma, and human deficiency virus.<sup>14,15</sup> Some vaccinations (against typhoid, influenza, measles, pneumococcal infections, and meningococcal meningitis) have been also implicated in pathogenesis of HSP.<sup>16-18</sup> The palpable purpuric rash, and its typical distribution in the dependant areas of the body (lower limbs and buttocks) is characteristic of HSP. It occurred in all our patients, and it is essential for the diagnosis of HSP. Damage to cutaneous small blood vessels also results in local angioedema, which occurs in the scalp, scrotum, dorsum of the hands, and feet. In our study, scrotal edema occurred in 5 of 40 boys (13%). Arthritis is the second most frequent clinical feature of HSP. It occurred in 75% of our patients. The knees and ankles were the most frequently affected joints, and 11 patients had associated involvement of the joints of upper extremities. In our study, the incidence of arthritis varied according to age groups of patients. It occurred in 56% in children less than 5 years of age, in 79% of children between 5 and 9 years of age, and in 89% of children 10 years of age and above. Gastrointestinal manifestations occurred in 43 patients (63%) in our study, and they had colicky abdominal pain. Nineteen of them had also gastrointestinal bleeding, and 2 of these patients had grossly bloody stools. Vasculitis of the gastrointestinal tract is the cause of the pain, and bleeding. None of our patients had intussusception. Although the reported incidence varies widely ranging from 20-80%,<sup>3,11</sup> in the present study, nephritis occurred in 20 patients (29%) of the 68 patients. All these patients had mild urinary abnormalities in the form of microscopic hematuria, and mild proteinuria. All these patients had normal renal function tests, and none of them developed nephrotic syndrome or renal insufficiency. In our study, the incidence of renal involvement varied according to

age group. It occurred in 19% of children less than 5 years of age, in 26% of children between 5-9 years of age, and in 67% of children 10 years of age and above. The age-related incidence of nephritis and arthritis is difficult to explain. It may be due to the fact that antigenic triggers of HSP differ according to age group. The known triggers of HSP include viral infections, vaccines, and drugs. These antigens may play a role in selectivity of organs involved.<sup>19</sup> Renal manifestations of HSP in our study are milder than those reported by others,<sup>20-22</sup> and this may be explained by the fact that our findings may have the limitation due to the nature of any retrospective study.

In conclusion, the occurrence of HSP arthritis and nephritis in pediatric patients is age-related, and their incidence is increasing with age. Older children have higher incidence of nephritis and arthritis. Younger children have lower incidence of nephritis and arthritis. Renal involvement was mild during the acute phase of the disease in all age groups.

## References

1. Heberden W. Commentarii de Marlbaum Historia et Curation. London: Payne, 1802. p. 148-149.
2. Henoch EH. Vorlesugen Uber Kinderkrankheiten. In: Hirschward A, editor. Vohlesunger Uber Kinderkrankheiten. Berlin: Auff; 1899. p. 839.
3. Trapani S, Micheli A, Grisiolia F, Resti M, Chiappini E, Falcini F, et al. Henoch-Schonlein purpura in childhood: epidemiological and clinical analysis of 150 cases over a 5-year period and review of literature. *Semin Arthritis Rheum* 2005; 35: 143-153.
4. Scharer K, Krmar R, Querfeld U, Ruder H, Waldherr R, Schaefer F. Clinical outcome of Schonlein-Henoch nephritis in children. *Pediatr Nephrol* 1999; 13: 816-823.
5. Mills JA, Michel BA, Bloch DA, Calabrese LH, Hunder GG, Arend WP, et al. The American College of Rheumatology 1990 criteria for the classification of Henoch-Schonlein purpura. *Arthritis Rheum* 1990; 33: 1114-1121.
6. Allen DM, Diamond LK, Howell DA. Anaphylactoid purpura in children (Schonlein-Henoch syndrome): review with a follow-up of the renal complications. *AMA J Dis Child* 1960; 99: 833-834.
7. Tancrede-Bohin E, Ochonisky S, Vignon-Pennamen MD, Flaquel B, Morel P, Rybojad M. Schonlein-Henoch purpura in adult patients. Predictive factors for IgA glomerulonephritis in a retrospective study of 57 cases. *Arch Dermatol* 1997; 133: 438-442.
8. Calvino MC, LLorca J, Garcia-Porrúa C, Fernandez-Iglesias JL, Rodrigues-Ledo P, Gonzalez-Gay MA. Henoch-Schonlein purpura in children from northwestern Spain: a 20-year epidemiologic and clinical study. *Medicine* (Baltimore) 2001; 80: 279-290.
9. Dillon MJ. Childhood vasculitis. *Lupus* 1998; 7: 259-265.
10. Saulsbury FT. Henoch-Schonlein Purpura in children. Report of 100 patients and review of the literature. *Medicine* (Baltimore) 1999; 78: 395-409.
11. Abdel-Al YK, Hejazi Z, Majeed HA. Henoch-Schonlein purpura in Arab children. Analysis of 52 cases. *Tropic Geogr Med* 1990; 42: 52-57.
12. Nielsen HE. Epidemiology of Schonlein-Henoch purpura. *Acta Paediatr Scand* 1988; 77: 125-131.
13. al-Sheyyab M, el-Shanti H, Ajlouni S, Batieha A, Daoud AS. Henoch-Schonlein purpura: clinical experience and contemplations on a streptococcal association. *J Trop Pediatr* 1996; 42: 200-203.
14. Sussman M, Jones JH, Almeida JD, Lachmann PJ. Deficiency of the second component of complement associated with anaphylactoid purpura and the presence of mycoplasma in the serum. *Clin Exp Immunol* 1973; 14: 531-539.
15. Maggiore G, Martini A, Grifeo S, De Giacomo C, Scotta M. Hepatitis B virus infection and Schonlein-Henoch purpura. *Am J Dis Child* 1984; 138: 681-682.
16. Fox BC, Peterson A. Leucocytoclastic vasculitis after pneumococcal vaccination. *Am J Infect Control* 1998; 26: 365-366.
17. Patel U, Bradley JR, Hamilton DV. Henoch-Schonlein purpura after influenza vaccination. *Br Med J (Clin Res Ed)* 1988; 296: 1800.
18. Wise J. UK introduces new meningitis C vaccine. *BMJ* 1999; 319: 278.
19. Ilan Y, Naparstek Y. Henoch-Schonlein purpura in children and adults: is it one entity? *Semin Arthritis Rheum* 2002; 42: 139-140.
20. Koskimies O, Mir S, Rapola J, Vilska J. Henoch-Schonlein nephritis: long-term prognosis of unselected patients. *Arch Dis Child* 1981; 56: 482-484.
21. Stewart M, Savage JM, Bell B, McCord B. Long term renal prognosis of Henoch-Schonlein purpura in an unselected childhood population. *Eur J Pediatr* 1998; 147: 113-115.
22. Mir S, Yavascan O, Mutlubas F, Yeniay B, Sonmez F. Clinical outcome in children with Henoch-Schonlein nephritis. *Pediatr Nephrol* 2007; 22: 64-70.