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# Henoch-Schonlein purpura in Saudi Arabia: A retrospective study of 27 children in Taif region.

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**Abstract**

**Objective: The aim of this retrospective study was to assess epidemiologic, demographic characteristics and clinical findings of Henoch-Schönlein purpura (HSP) in the Taif region of Saudi Arabia.**

**Methods: Records of 27 patients who were followed-up with the diagnosis of HSP between January 2012 and December 2015 in the department of pediatrics in Alhada armed forces hospital of Taif region. Demographic characteristics of the patients, season of presentation, clinical findings, triggering factors, laboratory data, and the duration of follow-up periods were evaluated.**

**Results: Of the 27 patients, 14 were boys (52%) and 13 were girls (48%), with a ratio of 1.1:1. Ages ranged from 2 years to 18 years, with a mean of 8.3 years. About 45% of the patients had a history of preceding upper respiratory infection. All of them had the typical skin rash. The percentages of joint, gastro-intestinal and renal manifestations were 85.2%, 77.8% and 37%, respectively. Testicular involvement was found in two patients, while no involvement was recorded for the central nervous system.**

**Conclusion: It is obviously that HSP patients could have various clinical symptoms and exceptional complications; however, it can lead to long-term illness particularly in patients with severe kidney involvement. In this study, there were mean age and season distribution differences for the HSP patients in Taif region comparing to other area in KSA.**

**Keywords**: Children, Henoch-Schönlein purpura, Abdominal pain, Joints, Renal involvement, Saudi Arabia.

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## Introduction

Henoch-Schönlein Purpura (HSP) is the most commonly vasculitic disease observed during childhood. It is characterized clinically by a generalized palpable purpura, arthritis, arthralgia, nephritis and gastrointestinal symptoms (abdominal pain, GI bleeding). HSP was first recognized in 1801 by the physician Heberden and next in 1808 by the dermatologist Willan. However, the illness was named by two German physicians Henoch and his teacher Schönlein in 1837 [1]. Schönlein defined the correlation between purpura and arthritis, while Henoch discovered its association with abdominal pain in 1874. Also, Henoch discovered the association between purpura and renal involvement [2].

It is a systemic vasculitis disease with unknown etiology and distinguished by skin, joint, Gastrointestinal System (GIS), and kidney involvements [3]. Even though HSP can happen in all age groups, it is most commonly occurred in childhood. The annual incidence has been reported as 10-20 cases per 100,000 [2]. HSP is more commonly occurred in winter and spring. Usually boys are affected more than girls.3 75% of the children patients are under 8 years of age, while 90% are less than 10 years of age. So, in average, the mean age of HSP patients in several studies is 6 years [4-6].

Although the etiology of HSP is not well known, several factors considered as a reason for the disease include infections (bacterial, viral, parasites), medications, vaccines, tumors, insect bite, and some foods [7-9]. From literature, the most important significant factor indicating long-term prognosis is the severity of kidney involvement [10]. Also, the antibody immunoglobulin A (IgA) and some proinflammatory cytokines have a key role in the

pathogenesis of HSP [11]. It is a well-known that the typical clinical characteristics involved in HSP are the triad of palpable purpura, abdominal pain, arthralgia and arthritis. While, progressive renal function injury, bowel perforation, central nerve system involvement are rare. The existence of purpura, which is non-thrombocytopenic, is the main part for the diagnosis of HSP. Regularly, the purpura is located on lower extremities and buttocks parts [12]. Finally, in general HSP is considered benign, self-limited and the treatment is supportive.

The aim of this retrospective study is to assess the demographic and epidemiologic characteristics of HSP in Saudi children reside in Taif governorate. It is believed that the clinical features could help doctors to make the correct diagnosis and deliver the correct medicine and nursing.

## Methods

Records of patients who were followed-up with the diagnosis of HSP between January 2012 and December 2015 in the department of pediatrics of Alhada armed forces hospital, Taif region, were retrospectively evaluated. The study was conducted and approved by the research and ethics committee of the participating hospital. The patients were re-assessed according to EULAR/PRINTO/PRES criteria and those having the diagnostic criteria were involved [13]. Data on the following items were analyzed: age, gender, season of presentation, complaints on admission, triggering factors, clinical manifestations (including location of skin and joint lesions, gastrointestinal and renal manifestations), weight, height, blood pressure, complete blood count, C-reactive protein level, erythrocyte sedimentation rate, albumin level, fecal occult blood (FOB), complete urinalysis, type of treatment, and follow-up periods.

Hypertension was determined as a systolic and/or diastolic blood pressure of ≥ 95 percentile using 3 separate measurements according to age, height, and gender [14]. Joint involvement was defined as joint swelling and/or functional limitation of joint. GIS involvement was classified as stomachache and/or faecal occult blood positivity, presence of melena, hematemesis, hematochezia, or invagination [15,16]. Recurrence was characterized as new skin rashes refined at least 4 weeks after disease recovery or return of other signs [17]. Kidney involvement was described as microscopic (presence of erythrocytes by ≥ 5 in the centrifuged urine at zooming power of 40X) or macroscopic hematuria and/or proteinuria (presence of protein >4 mg/m$^2$/h or protein/creatinine >0.2 mg/mg creatinine in 24 h urine) and/or reduced kidney function or nephrotic syndrome [18].

## Statistical Analysis

The results presented as mean ± Standard Deviation (SD) for continuous variables. The Microsoft Excel 2010 was used in such analysis. Categorical variables were expressed by percentages.

## Results

This retrospective study was conducted on children during the period of January 2012 to December 2015 to evaluate the clinical course and outcome of the children with HSP. The study included 27 Saudi children as a primary presentation with HSP. Of these, 14 were boys (52.8%), giving a male to female ratio of 1.1:1 (Table 1).

The age range was from 2 to 18 years (mean age 8.3 years). The age and gender distribution showed that most HSP children (20 cases, 74%) were less than 10 years old, while 7 cases of HSP children (26%) were between 11 and 18 years old (Figure 1). This All 27 cases It was found that 12 cases (44.5%) occurred in autumn, 9 cases (33.3%) in summer, 4 cases (14.8%) in winter and 2 cases (7.4%) in spring (Table 1).

Epidemiologic features of 27 patients are presented in Table 1, while the distribution of clinical findings of the patients is presented in Table 2. In less than half of the patients (n=12; 44.5%), upper respiratory tract infection

***Table 1.*** *Epidemiologic factors in 27 patients with Henoch-Schönlein purpura*

| | **n (%)** |
|---|---|
| ***Age at onset (years)*** | |
| Range | 2-18 |
| Mean | 8.3 |
| ***Gender*** | |
| Male | 14 (52) |
| Female | 13 (48) |
| Male to female ratio | 1.1:1 |
| ***Seasonal distribution*** | |
| Fall | 12 (44.5) |
| Summer | 9 (33.3) |
| Winter | 4 (14.8) |
| Spring | 2 (7.4) |
| ***Triggering factors*** | |
| Fever alone | 15 (56) |
| URTI* | 12 (44.5) |
| Gastrointestinal | 1 (3.7) |

*URTI: Upper Respiratory Tract Infection

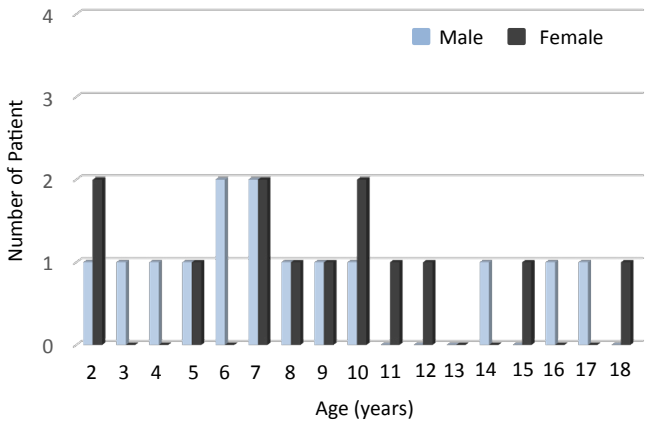


***Figure 1.*** *Age and gender distribution of 27 children with Henoch-Schönlein purpura*

***Table 2.*** *Clinical features of 27 patients with Henoch-Schönlein purpura*

| | n (%) |
|---|---|
| **Skin purpura** | 27 (100) |
| ***Rash location*** | |
| Lower limb | 22 (81.5) |
| Buttocks | 7 (26) |
| Face | 2 (7.4) |
| Arms | 2 (7.4) |
| Abdomen | 1 (3.7) |
| ***Joint involvement*** | |
| Arthralgia | 17 (63) |
| Arthritis | 6 (22.2) |
| ***GIS involvement*** | |
| Abdominal pains | 21 (77.8) |
| Bloody stool | 13 (48) |
| ***Renal involvement*** | |
| Microscopic hematuria | 7 (26) |
| Macroscopic hematuria | 2 (7.4) |
| Proteinuria | 7 (26) |
| Hypertension | 2 (7.4) |
| Nephrotic syndrome | 1 (3.7) |
| Acute kidney injury | 1 (3.7) |
| ***Testicular involvement*** | 2 (7.4) |
| **CNS** | 0 (0.0) |

CNS: Central Nervous System; GIS: Gastrointestinal System.

(URTI) preceded the onset of the rash by a few days to one week, whereas 15 cases (56%) had fever before the onset of the rash. Clinically, rash was presented in all patients. The purpura lesions of most patients were concentrated on the lower limb and buttocks. Joint involvement occurred in many HSP children (23 cases; 85.2%). Arthralgia and arthritis occurred in 17 (63%) and 6 (22.2%) of the patients, respectively. Ankle joints were most frequently affected, followed by knees, wrist and elbow.

Gastrointestinal tract (GIT) was the second most common system involved and manifested as abdominal pain in 21 cases (77.8%) and bloody stool in 13 cases (48%).

Renal involvement was observed in 10 cases (37%). Of these patients, 7 cases (26%) displayed microscopic hematuria; 2 patients (7.4%) had macroscopic hematuria; 7 cases (26%) had proteinuria, while 2 children (7.4%) were hypertensive. Nephrotic syndrome was documented in one case (3.4%). Two cases (7.4%) reported testicular involvement in the form of scrotal swelling. Central nervous system (CNS) was not detected in any patients. Other laboratory findings of the acute phase were evaluated and presented in Table 3.

Based on this evaluation, an increased ESR (ESR>20 mm/h) was reported in 12 patients (40.7%). Thrombocytosis (platelets > 500 × $10^9$/L) was detected in 4 cases (14.8%), leukocytosis (WBC>12 × $10^9$/L) documented in 3 patients (11.1%) and serum C3 (<900 mg/L) decreased in one patient (3.7%).

Fifteen cases (55.5.7%) received prednisolone with

| Findings | Positive cases number (%) |
|---|---|
| Thrombocytosis (platelets>500 × $10^9$/L) | 4 (14.8) |
| Leukocytosis (WBC>12 × $10^9$/L) | 3 (11.1) |
| Elevated ESR (ESR>20 mm/ h) | 12 (40.7) |
| Low C3 (<900 mg/L) | 1 (3.7) |

WBC: White Blood Cell; ESR: Erythrocyte Sedimentation Rate; C3: Complement 3

***Table 3.*** *Labroratory findings of 27 patients with Henoch-Schönlein purpura*

a dosage ranging from 1-2 mg/kg/day for 7 days for abdominal pain and 15-30 days in patients with nephritis. The average duration of prednisolone treatment was about 9.1 days. Regarding outcome; only one child developed acute kidney injury developed to mild chronic kidney disease (CKD), while all the other patients showed full recovery. No recurrence cases were reported through the 4 years follow up.

## Discussion

HSP is a systemic vasculitis involving the small blood vessels of skin, joints, intestine, and kidneys. It is the most common element of nonthrombocytopenic purpura in children [12]. It has been documented in all individuals aged from 6 months to 86 years [5,10,19]. But, most cases of HSP occur between the ages of 5 to 15 years, giving mean age approximately 5-6 years [20-22]. In the present study, the epidemiologic and clinical findings were compared with those reported from Saudi Arabia and other countries (Tables 4 and 5).

The mean age of the present study was 8.3 years (range, 2-18 years) (Table 1). The present mean age was observed to be consistent with those reported in children who consulted at King Abdulaziz University Hospital, Jeddah, Saudi Arabia and at Asir Central Hospital in the southern province of Saudi Arabia (Table 4) [23-25]. Similarly, Table et al. [25] documented the mean age of children with HSP in Turkey by 8.8 years. By contrast, Lardhi et al. [20] stated that the mean age at onset of the HSP was 6.3 years for children patients who were followed up at King Fahad University Hospital in the eastern province of Saudi Arabia. Also, Özer et al. [26] reported a higher mean age of 9.8 year in Turkish children that had HSP (Table 5). Of the study patients, 52% were males and 48% were females, with a male-to-female ratio of 1.1:1. This ratio was similar to those in the literature inside Saudi Arabia or other countries (Tables 4 and 5). However, there are also some studies representing that HSP is more frequent in females [5,17]. In the present study, HSP was most common in the fall and least frequent in the spring. Several studies in Saudi Arabia documented that the disease symptoms was increased frequently in fall and winter (Tables 4). Additionally, several studies in different countries documented symptom onset during fall and winter (Table 5). By contrast, Al-Harbi stated HSP cases in summer inside Saudi Arabia [24]. Consequently, it can

***Table 4***. *Comparison of the findings of the present study with those of similar studies conducted in Saudi Arabia*

| | Current study | Lardhi [20] | Bukhari et al. [23] | AI-Harbi [24] | Zimmo and Akbar [27] | AI-Rasheed and Abdurahman [30] |
|---|---|---|---|---|---|---|
| **Number of children (n)** | 27 | 78 | 29 | 55 | 18 | 40 |
| **Mean age (year)** | 8.3 | 6.3 | 7.5 | 8.5 | 5.9 | - |
| **Gender ratio (M:F)** | 1.1:1.0 | 1.4:1.0 | 1.07:1.0 | 1.0:1.1 | 1:1 | - |
| **preceding URTI** | 12 (44.5%) | 41 (52.5%) | 12 (41.4%) | - | 9 (50%) | - |
| **Most frequent season** | Fall | Fall and Winter | - | Summer | - | Winter |
| **Joint involvement** | 23 (85.2%) | 52 (66%) | 24 (82%) | 42 (76%) | 13 (72%) | 23 (58%) |
| **GIS involvement** | 21 (77.8) | 37 (47%) | 21 (72.4%) | 43 (78%) | 13 (72%) | 23 (58%) |
| **Testicular involvement** | 2/14 (14.3%) | 7/46 (15%) | - | - | - | - |
| **Renal involvement** | 10 (37%) | 19 (24%) | 7 (24.1%) | 11 (20%) | 1 (6%) | 15 (38%) |
| **Hematuria** | 9 (33.3%) | 19 (24%) | 4 (13.8%) | - | - | - |
| **Proteinuria** | 7 (26%) | 5 (6.4%) | - | - | - | - |

URTI: Upper Respiratory Tract Infection; GIS: Gastrointestinal Manifestations

***Table 5***. *Comparison of the findings of the present study with those of the studies conducted from other countries*

| | Current study | Dawod and Akl [21]. | Hamdan and Barqawi [22]. | Saulsbury [4]. | Jauhola et al. [17, 33] | Chen et al. [12]. | Özer et al. [26]. |
|---|---|---|---|---|---|---|---|
| **Country** | Saudi Arabia | Qatar | Jordan | USA | Finland | China | Turkey |
| **Number of children (n)** | 27 | 40 | 68 | 77 | 223 | 120 | 53 |
| **Mean age (year)** | 8.3 | 6.0 | 5.9 | 5.9 | 7.1 | 6.6 | 9.8 |
| **Gender ratio (M:F)** | 1.1:1.0 | 1.6:1.0 | 1.4:1.0 | 1.32:1.0 | 1.2:1.0 | 1.9:1.0 | 1.0:1.12 |
| **preceding URTI** | 12 (44.5%) | 20 (50%) | - | 28 (36%) | 161 (72%) | 52 (43%) | - |
| **Most frequent season** | Fall | - | Fall | Winter | Winter | Winter | - |
| **Joint involvement** | 23 (85.2%) | 32 (80%) | 51 (75%) | 52 (67%) | 200 (90%) | 79 (65.8%) | 24 (45.3%) |
| **GIS involvement** | 21 (77.8) | 26 (65%) | 43 (63%) | 46 (60%) | 126 (57%) | 89 (74.2%) | 33 (62.3%) |
| **Testicular involvement** | 2/14 (14.3%) | 1/25 (4%)* | - | 2/46 (4%) | 17/122 (14%) | - | - |
| **Renal involvement** | 10 (37%) | 7 (17.39%) | 20 (29%) | 16 (21%) | 102 (46%) | 65 (54.2%) | 25 (47%) |
| **Hematuria** | 9 (33.3%) | 1 (2.5%) | 14 (20.6%) | 16 (21%) | 93 (42%) | 32 (26.7%) | 9 (17%) |
| **Proteinuria** | 7 (26%) | 1 (2.5%) | 6 (8.8%) | 7 (9%) | 88 (39%) | 32 (26.7) | 22 (41%) |

*Penile swelling; URTI: Upper Respiratory Tract Infection; GIS: Gastrointestinal Manifestations

conclude that symptoms can occur any time throughout the year.

In agreement to several studies conducted in Saudi Arabia (Table 4) and other countries (Table 5), upper respiratory tract infections (URTI) have been described to precede HSP [12,17,20,21,23]. In the current study, 44.5% of the patients had symptom of URTI. This result is similar to some reports performed in Saudi Arabia and in Qatar [20,21,23]. In the present study, joint involvement occurred in about 85.2% of the cases; arthralgia in 17 cases and arthritis in 6 cases. Different studies reported that joint involvement can be found in 45-90% of the patients [17,23]. In our children patients, ankles and knees were the most commonly involved joints, followed by wrists and elbows, whereas hip and shoulder involvement was not reported in any case. Similarly, Lardhi et al. [20] found that hip and shoulder involvement was very rare and was found only in one case each.

In many studies, GIT involvement has been reported in approximately two thirds of patients with HSP in Saudi Arabia which is consistent with our study [23,24,26,27]. Abdominal pain and bloody stool were the most frequent symptoms seen in 77.8% and 48% of our patients, respectively. Kawasaki et al. [28] who designated infrequent complications, such as intussusception, bowel ischemia, acute appendicitis, pancreatitis, bowel infarction, and intestinal perforation with this disease. However, these rare complications were not seen in our cases.

Renal involvement is a matter of concern between patients with HSP, because it may increase the frequently of hypertension, nephrotic or nephritic syndromes or renal insufficiency. The rate of children patients who had renal involvement varied between 20%-60% with HSP in different studies [28,29]. In the current study, renal involvement was found in 37% of the children patients and the typical symptoms were hematuria and proteinuria (Table 2). This result was in agreement with the data that reported by AI-Rasheed and Abdurahman in Saudi Arabia and with the study conducted in Jordan [22,30]. By contrast, renal involvement was reported in 54.2%, 47% and 46% of the HSP patients in China, Turkey and Finland, respectively (Table 5) [12,17,26].

During the follow-up period in the present study, only one case was documented to have acute kidney injury that progressed to mild CKD. Two patients were reported with hypertensive; one has nephrotic syndrome and the other had mild CKD. Testicular involvement has been

documented two boys that had scrotal swelling (Table 2). Similar results were reported in Saudi Arabia, USA, and Finland [4,16,20].

Based on literature, there is no specific examination for the diagnostic of HSP. Even though, there is evidence that laboratory patients with HSP have elevated erythrocyte sedimentation rates, C-reactive protein levels, white blood cell counts, platelet counts and immunoglobulin A levels, none of these tests is specific or diagnostic. In the present study, 14.8% of the patients had thrombocytosis platelets over than $500 \times 10^9$/L and 40.7% patients had an increased ESR. Also, Leukocytosis over $12 \times 10^9$/L was found in 11.1% of the patients and a low C3 serum level was found in one patient (3.7%). Similar findings have been reported previously in Saudi Arabia and China [12,20].

Many traditional treatments like hydration, bed rest, analgesics and non-steroidal anti-inflammatory drugs were found to be an effective in the majority of the HSP cases. Thus, 44.5% of the patients of the current study managed initially conservatively. Sometime, it is not enough to control the disease symptoms by these traditional treatments, therefore more potent anti-inflammatory drugs like corticosteroids are included especially in the following situations: Severe abdominal pain or GI bleeding, severe soft tissue edema, severe scrotal edema, persistent nephrotic syndrome [31]. In agreement with other studies, almost all our cases showed full recovery, while only one patient (3.7%) developed acute kidney injury [28,29]. Although corticosteroids are used in HSP with severe gastrointestinal symptoms and/or kidney involvement, there are few data from randomized controlled trials to support their use for gastrointestinal symptoms but there is no from randomized controlled trials to support their use for kidney involvement [32,33].

## Conclusion

HSP is a vasculitis that can involve mostly with skin and joints and other organs and systems. In the current study, the mean age and occurrence season were diverse than other Saudi studies. The cases with HSP should be closely followed for complications especially with kidney and/or gastrointestinal system involvement that can develop during early or late period. More investigation is necessary to study HSP in Taif region especially for the prevalence, clinical manifestations, preceding factors and complications.

## References


1. Tarvin SE, Ballinger S. Henoch Schonlein Purpura. Curr Paediatr 2006; 16: 259-263.
2. Saulsbury FT. Henoch-Schönlein Purpura. Curr Opin Rheumatol 2010; 22: 598-602.
3. Saulsbury FT. Clinical update: Henoch Schonlein Purpura. Lancet 2007; 369: 976-978.
4. Saulsbury FT. Henoch-Schonlein purpura in children report of 100 patients and review of the literature. Medicine 1999; 78: 395-409.
5. Calvino MC, Llorca J, Garcia-Porrua C, et al. Henoch Schonlein Purpura in children from northwestern Spain: A 20 year epidemiologic and clinical study. Medicine 2001; 80: 279-290.
6. Trapani S, Micheli A, Grisolia 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.
7. Cassidy JT, Petty RE. Leukocytoclastic vasculitis. In: Cassidy JT, Petty RE, editor. Textbook of pediatric rheumatology. 4th ed. New York: Churchill Livingstone 200; 569-574.
8. Dillon MJ. Childhood vasculitis. Lupus 1998; 7: 265-259.
9. Lahita RG. Influence of age on Henoch Schonlein purpura. Lancet 1977; 350: 11161117-.
10. 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: 833-854.
11. Yang YH, Chuang YH, Wang LC, et al. The immunobiology of Henoch-Schonlein purpura. Autoimmun Rev 2008; 7: 179-184.
12. Chen O, Zhu XB, Ren P, et al. Henoch Schonlein Purpura in children: Clinical analysis of 120 cases. Afr Health Sci 2013; 13: 94-99.
13. Ozen S, Pistorio A, Iusan SM, et al. EULAR/PRINTO/PRES criteria for Henoch-Schönlein purpura, childhood polyarteritis nodosa, childhood Wegener granulomatosis and childhood Takayasu arteritis: Ankara 2008. Part II: Final classification criteria. Ann Rheum Dis 2010; 69: 798-806.
14. Awazu M. Epidemiology of Hypertension. In: Avner ED, Harmon WE, Niaudet P, Yoshikawa N, eds. Pediatric Nephrology. 6th ed. Berlin: Springer 2009; 1465-1466.
15. Brogan P, Eleftheriou D, Dillon M. Small vessel vasculitis. Pediatr Nephrol 2010; 25: 1025-1035.
16. Yılmaz A, Aytaç MB, Ekinci Z. Retrospective assessment of children with Henoch-Schonlein Purpura in and around Kocaeli province and comparison with literature. Erciyes Med J 2014; 36: 62-67.
17. Jauhola O, Ronkainen J, Koskimies O, et al. Renal manifestations of Henoch Schonlein purpura in a 6 month prospective study of 223 children. Arch Dis Child 2010; 95: 877-882.
18. Miller ML, Pachman LM. Henoch-Schonlein purpura. In: Kliegmen RM, Jenson HB, Behrman RE, eds. Nelson Textbook of Pediatrics. 17th ed. Philadelphia: Saunders 2004; 827-828.
19. Trancrede-Bohin E, Ochonisky S, Vignon-Pennamen MD. Henoch-Schonlein Purpura in adult patients; Predictive factors for IgA glomerulonephritis in a retrospective study of 57 cases. Arch Dermatol 1997; 133: 438-442.
20. Lardhi AA. Henoch-Schonlein purpura in children from the

eastern province of Saudi Arabia. Saudi Med J 2012; 33: 973-978.

21. Dawod ST, Akl KF. Henoch -Schonlein Purpura syndrome in Qatar: The effects of steroid therapy and paucity of renal involvement. Ann Trop Paediatr 1990; 10: 279-284.
22. Hamdan JM, Barqawi MA. Henoch-Schonlein Purpura in children: Influence of age on the incidence of nephritis and artbritis. Saudi Med J 2008; 29: 549-552.
23. Bukhari EM, Al-Sofyani KA, Muzaffer MA. Spectrum of Henoch-Schonlein Purpura in children: A single-center experience from western province of Saudi Arabia. Open J Rheumatol Autoimmune Dis 2015; 5: 17-22.
24. AI-Harbi NN. Henoch-Schonlein syndrome in children: Experience from Southern part of Saudi Arabia. East Afr Med J 1996: 73: 191-193.
25. Tabel Y, Inanc FC, Dogan DG, et al. Clinical features of children with Henoch-Schonlein Purpura: Risk factors associated with renal involvement. Iran J Kidney Dis 2012; 6: 269-274.
26. Özer S, Kasap T, Yılmaz R, et al. Henoch-Schönlein Purpura in children: Retrospective evaluation of 53 cases. J Contemp Med 2015; 5: 152-156.
27. Zimmo SK, Akbar DA. Analysis of Henoch-Schonlein Purpura in adults and children: Experience at King Abdulaziz University Hospital. JKAU: Med Sci 2001; 9: 9-16.
28. Kawasaki Y, Ono A, Ohara S, et al. Henoch-Schönlein Purpura nephritis in childhood: Pathogenesis, prognostic factors and treatment. Fukushima J Med Sci 2013; 59: 15-26.
29. Trnka P. Henoch-Schonlein Purpura in Children. J Paediatr Child Health 2013; 49: 995-1003.
30. AI-Rasheed SA, Abdurahman MB. Henoch-Schonlein purpura in Saudi Arabia. J Trop Pediatr 1991; 37: 127-131.
31. Weiss PF, Klink AJ, Localio R, et al. Corticosteroids may improve clinical outcomes during hospitalization for Henoch-Schönlein Purpura. Pediatrics 2010; 126: 674-681.
32. Hahn D, Hodson EM, Willis NS, et al. Interventions for preventing and treating kidney disease in Henoch-Schönlein Purpura (HSP). Cochrane Database of Systematic Reviews 2015; 8: CD005128.
33. Jauhola O, Ronkainen J, Koskimies O, et al. Clinical course of extrarenal symptoms in Henoch-Schonlein purpura: A 6 month prospective study. Arch Dis Child 2010; 95:871-876

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