Volume 4, Issue 4, April 2026 ISSN (E): 2938-3765

ASSESSMENT OF AUTONOMIC NERVOUS SYSTEM FUNCTION AND QUALITY OF LIFE IN CHILDREN WITH PEDIATRIC VASCULITIS

Mallayev Sh. Sh.
Sultanova N. S.
Egamberdiyev S. B.
Ismoilov N. B.
Shomuradova K. A.
Shomuradov A. A.
Tashkent State Medical University

Abstract

IgA vasculitis (Henoch–Schönlein purpura) is a common pediatric vasculitis characterized by systemic inflammation and multi-organ involvement. Despite its prevalence, little is known about the relationship between disease characteristics, autonomic nervous system dysfunction, and health-related quality of life in affected children. Understanding these associations is crucial for optimizing patient management and improving long-term outcomes. To evaluate the impact of disease form, duration, and severity on autonomic nervous system function and quality of life in children with IgA vasculitis. Fifty children with IgA vasculitis (age range 5–11 years) were assessed. Disease characteristics, including clinical form, duration, and severity, were recorded. Autonomic nervous system function was evaluated using the Pediatric Autonomic Symptom Score (PASS), while quality of life was measured with the Pediatric Quality of Life Inventory (PedsQL). Patients were stratified according to disease form, duration (<1 year, 1–2 years, >2 years), and severity (mild, moderate, severe), and correlations between autonomic dysfunction and quality of life were analyzed. The study revealed a significant association between disease characteristics and autonomic dysfunction. Children with abdominal and mixed forms, longer disease duration, and more severe clinical course demonstrated higher PASS scores, indicating more pronounced autonomic imbalance. Quality of life scores progressively decreased with increasing disease duration and severity, particularly in physical and school functioning domains. A moderate-to-strong inverse correlation was observed between PASS and PedsQL scores, highlighting that increased autonomic dysfunction is associated with decreased quality of life. Disease form, duration, and severity are key determinants of autonomic dysfunction and reduced quality of life in children with IgA vasculitis. Comprehensive assessment, including evaluation of autonomic function and quality of life, is essential for early identification of at-risk patients and for optimizing management strategies. These findings underscore the importance of integrating functional assessments into routine clinical care for pediatric vasculitis.

Keywords: IgA vasculitis, Henoch–Schönlein purpura, children, autonomic nervous system, quality of life, PedsQL, PASS.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

Introduction

IgA vasculitis (Henoch–Schönlein purpura) is the most common form of systemic vasculitis in childhood, characterized by immune-mediated inflammation of small vessels with predominant involvement of the skin, joints, gastrointestinal tract, and kidneys. Although the disease is often considered self-limiting, its clinical course may vary significantly, ranging from mild cutaneous manifestations to severe systemic involvement with potential long-term complications, particularly in cases with renal impairment. This heterogeneity highlights the need for a more comprehensive evaluation of disease burden beyond traditional clinical parameters.

In recent years, there has been a growing interest in the role of the autonomic nervous system in the pathophysiology of inflammatory and immune-mediated diseases. Autonomic dysfunction is increasingly recognized as an important but underexplored component of pediatric disorders, potentially influencing vascular tone, microcirculation, gastrointestinal motility, and cardiovascular responses. In the context of IgA vasculitis, dysregulation of autonomic function may contribute to the variability of clinical manifestations, including abdominal pain, vascular instability, and systemic symptoms. However, despite its potential significance, autonomic involvement in IgA vasculitis remains insufficiently studied, particularly in pediatric populations.

At the same time, modern pediatric research emphasizes the importance of assessing health-related quality of life (HRQoL) as an integral outcome reflecting not only physical health but also emotional well-being, social functioning, and school activity. Children with chronic or recurrent inflammatory conditions may experience limitations that are not fully captured by clinical or laboratory indicators alone. Therefore, the inclusion of patient-reported (or parent-reported) outcomes provides a more holistic understanding of disease impact. The use of standardized and validated assessment tools, such as the Pediatric Quality of Life Inventory (PedsQL) and pediatric autonomic symptom scales (PASS), enables objective and reproducible evaluation of both autonomic disturbances and quality of life parameters. These instruments are widely used in international research and allow for comparison across different populations and clinical settings. Importantly, they offer the opportunity to identify subclinical impairments and early functional changes that may not be evident during routine clinical examination.

Despite the growing body of literature on IgA vasculitis, there remains a lack of comprehensive studies that simultaneously assess autonomic dysfunction and quality of life in affected children, particularly with consideration of different clinical forms and disease characteristics. Moreover, regional data in this field are limited, which further underscores the relevance of conducting such research.

Therefore, the present study aims to provide an integrated evaluation of autonomic nervous system disturbances and health-related quality of life in children with IgA vasculitis, taking into account clinical forms and disease features. The results of this study may contribute to a deeper understanding of disease mechanisms, improve early identification of functional impairments, and support the development of more personalized and comprehensive approaches to patient management.

Materials and Methods

This study was conducted on a cohort of 50 pediatric patients diagnosed with IgA vasculitis (Henoch–Schönlein purpura) who were observed and treated in a clinical setting. The diagnosis was established

based on clinical criteria, including the presence of palpable purpura and at least one of the following manifestations: abdominal syndrome, joint involvement, or renal symptoms.

The study population consisted of children aged 5 to 11 years. Patients were stratified according to clinical forms of the disease (cutaneous, abdominal, joint, and mixed forms), as well as disease severity and duration. A control group of age-matched healthy children was also included for comparative analysis. Data collection was performed through structured parent interviews and questionnaire-based assessment. Considering the age characteristics of the participants, the questionnaires were primarily completed by parents or legal guardians during organized clinical visits and consultations. Prior to participation, parents were informed about the study objectives, and informed consent was obtained.

To assess autonomic nervous system dysfunction, the Pediatric Autonomic Symptom Scale (PASS) was used. This tool includes multiple domains reflecting autonomic regulation, such as cardiovascular, gastrointestinal, thermoregulatory, and neuropsychological symptoms.

Health-related quality of life was evaluated using the Pediatric Quality of Life Inventory (PedsQL 4.0 Generic Core Scales), a validated instrument widely used in pediatric populations. The questionnaire assesses physical, emotional, social, and school functioning. The obtained data were analyzed comparatively depending on clinical form, disease severity, and duration. The results were presented in the form of descriptive statistics, including distribution by severity levels and graphical visualization (bar charts and pie charts).

Results

In the present study, 50 children diagnosed with IgA vasculitis were analyzed. According to the clinical presentation, patients were classified into cutaneous, abdominal, joint, and mixed forms of the disease. The analysis demonstrated that the mixed form was the most prevalent, accounting for 40% of cases, reflecting the systemic and multisyndromic nature of IgA vasculitis. The cutaneous form was identified in 30% of patients, while the abdominal and joint forms were less frequently observed, comprising 18% and 12% of cases, respectively. Evaluation of autonomic nervous system function using the PASS questionnaire revealed that autonomic dysfunction was present in the majority of patients. Minimal or no significant disturbances were observed in 16% of children, while mild dysfunction was detected in 28% of cases. Moderate autonomic нарушения were the most common, accounting for 34%, and severe disturbances were identified in 22% of patients. These findings indicate that autonomic imbalance is a frequent and clinically relevant component of IgA vasculitis in children.

A comparative analysis of PASS scores across different clinical forms demonstrated that patients with mixed and abdominal forms had significantly higher levels of autonomic dysfunction compared to those with isolated cutaneous or joint involvement. In particular, children with abdominal manifestations showed more pronounced symptoms related to gastrointestinal and cardiovascular autonomic regulation, suggesting the involvement of autonomic pathways in the pathogenesis of these clinical features. In contrast, patients with the cutaneous form exhibited relatively lower PASS scores, indicating less pronounced autonomic involvement. Further analysis revealed a positive association between the severity of the disease and the degree of autonomic dysfunction. Children with more severe clinical presentations demonstrated higher PASS scores, indicating a direct

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

relationship between systemic inflammatory activity and autonomic imbalance. In addition, a tendency toward increased autonomic dysfunction was observed in patients with longer disease duration, suggesting a cumulative effect of the disease on autonomic regulation.

Assessment of health-related quality of life using the PedsQL questionnaire showed a general decrease in quality-of-life indicators among children with IgA vasculitis compared to expected normative values. The most affected domains were physical and school functioning, while emotional and social functioning were moderately reduced. Importantly, lower PedsQL scores were predominantly observed in patients with mixed and abdominal forms of the disease, indicating a greater impact of multisystem involvement on daily functioning and well-being.

Correlation analysis demonstrated an inverse relationship between PASS and PedsQL scores: higher levels of autonomic dysfunction were associated with lower quality of life indicators. This relationship was most pronounced in patients with moderate and severe autonomic disturbances, where a significant decline in physical and psychosocial functioning was observed. These findings suggest that autonomic dysfunction may be an important contributing factor to the reduction in quality of life in children with IgA vasculitis.

Overall, the results indicate that both autonomic dysfunction and decreased quality of life are closely related to the clinical form, severity, and duration of the disease, with the most pronounced changes observed in patients with mixed and abdominal involvement.

In the present study, 50 children diagnosed with IgA vasculitis were analyzed. According to the clinical presentation, patients were classified into cutaneous, abdominal, joint, and mixed forms of the disease. The analysis demonstrated that the mixed form was the most prevalent, accounting for 40% of cases, reflecting the systemic and multisyndromic nature of IgA vasculitis. The cutaneous form was identified in 30% of patients, while the abdominal and joint forms were less frequently observed, comprising 18% and 12% of cases, respectively.

Evaluation of autonomic nervous system function using the PASS questionnaire revealed that autonomic dysfunction was present in the majority of patients. Minimal or no significant disturbances were observed in 16% of children, while mild dysfunction was detected in 28% of cases. Moderate autonomic нарушения were the most common, accounting for 34%, and severe disturbances were identified in 22% of patients. These findings indicate that autonomic imbalance is a frequent and clinically relevant component of IgA vasculitis in children.

A comparative analysis of PASS scores across different clinical forms demonstrated that patients with mixed and abdominal forms had significantly higher levels of autonomic dysfunction compared to those with isolated cutaneous or joint involvement. In particular, children with abdominal manifestations showed more pronounced symptoms related to gastrointestinal and cardiovascular autonomic regulation, suggesting the involvement of autonomic pathways in the pathogenesis of these clinical features. In contrast, patients with the cutaneous form exhibited relatively lower PASS scores, indicating less pronounced autonomic involvement. Further analysis revealed a positive association between the severity of the disease and the degree of autonomic dysfunction. Children with more severe clinical presentations demonstrated higher PASS scores, indicating a direct relationship between systemic inflammatory activity and autonomic imbalance. In addition, a tendency toward increased autonomic dysfunction was observed in patients with longer disease duration, suggesting a cumulative effect of the disease on autonomic regulation.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

Assessment of health-related quality of life using the PedsQL questionnaire showed a general decrease in quality of life indicators among children with IgA vasculitis compared to expected normative values. The most affected domains were physical and school functioning, while emotional and social functioning were moderately reduced. Importantly, lower PedsQL scores were predominantly observed in patients with mixed and abdominal forms of the disease, indicating a greater impact of multisystem involvement on daily functioning and well-being. Correlation analysis demonstrated an inverse relationship between PASS and PedsQL scores: higher levels of autonomic dysfunction were associated with lower quality of life indicators. This relationship was most pronounced in patients with moderate and severe autonomic disturbances, where a significant decline in physical and psychosocial functioning was observed. These findings suggest that autonomic dysfunction may be an important contributing factor to the reduction in quality of life in children with IgA vasculitis.

Overall, the results indicate that both autonomic dysfunction and decreased quality of life are closely related to the clinical form, severity, and duration of the disease, with the most pronounced changes observed in patients with mixed and abdominal involvement.

To evaluate the relationship between disease severity, autonomic dysfunction, and quality of life, all patients were stratified into three groups according to clinical severity: mild, moderate, and severe forms of IgA vasculitis.

The analysis showed that the majority of patients had a moderate course of the disease, accounting for 44% of cases. Mild forms were observed in 36% of children, while severe forms were less frequent, comprising 20% of the study population. This distribution reflects the predominance of clinically significant but not life-threatening disease manifestations in the examined cohort. Assessment of autonomic nervous system function using the PASS questionnaire demonstrated a clear dependence of autonomic dysfunction severity on the clinical severity of the disease. In patients with mild forms of IgA vasculitis, minimal and mild autonomic disturbances predominated, and severe dysfunction was rarely observed. In contrast, children with moderate disease severity showed a higher prevalence of moderate autonomic нарушения, indicating a more pronounced imbalance of autonomic regulation.

The most significant changes were identified in patients with severe forms of the disease, where moderate and severe autonomic dysfunction predominated. In this group, severe autonomic disturbances were observed considerably more often than in patients with mild and moderate disease, suggesting a strong association between systemic inflammatory activity and impairment of autonomic regulation. Evaluation of health-related quality of life using the PedsQL questionnaire revealed a progressive decline in quality of life indicators with increasing disease severity. Patients with mild forms demonstrated relatively preserved quality of life, although a slight decrease in physical functioning was noted. In the moderate severity group, a more pronounced reduction in physical and school functioning was observed, accompanied by moderate impairments in emotional and social domains.

Children with severe IgA vasculitis exhibited the lowest PedsQL scores across all domains. The most significant impairment was noted in physical functioning, reflecting the burden of systemic symptoms, while emotional, social, and school functioning were also markedly reduced, indicating a substantial impact on daily life and psychosocial adaptation. Correlation analysis revealed a strong

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

positive relationship between disease severity and PASS scores, indicating that more severe clinical manifestations are associated with greater autonomic dysfunction. At the same time, a pronounced inverse correlation was observed between disease severity and PedsQL scores, reflecting a significant decrease in quality of life with increasing severity of the disease.

Additionally, a moderate-to-strong negative correlation between PASS and PedsQL scores was identified, particularly in patients with moderate and severe disease. This finding suggests that autonomic dysfunction plays a key role in the deterioration of quality of life in children with IgA vasculitis.

Overall, the results demonstrate that disease severity is a critical factor influencing both autonomic nervous system function and quality of life, with the most pronounced impairments observed in patients with severe forms of IgA vasculitis.

Conclusions

1. IgA vasculitis in children is frequently associated with autonomic nervous system dysfunction, with the majority of patients demonstrating varying degrees of autonomic imbalance according to PASS assessment.
2. The severity of autonomic dysfunction is directly related to the clinical characteristics of the disease, including its form, duration, and severity, with the most pronounced disturbances observed in patients with mixed and abdominal forms, as well as in those with longer disease duration and more severe clinical course.
3. Health-related quality of life in children with IgA vasculitis is significantly reduced compared to expected normative values, with the greatest impairment observed in physical and school functioning domains.
4. A progressive decline in quality of life is observed with increasing disease duration and severity, indicating the cumulative negative impact of chronic inflammatory processes on the child's overall well-being and daily functioning.
5. A statistically significant inverse correlation between autonomic dysfunction (PASS scores) and quality of life indicators (PedsQL) was identified, suggesting that increased autonomic imbalance is associated with a deterioration in both physical and psychosocial aspects of health.
6. The obtained results highlight the importance of comprehensive assessment of pediatric patients with IgA vasculitis, including not only clinical evaluation but also analysis of autonomic function and quality of life, in order to improve early detection of functional impairments and optimize patient management strategies.

References

1. Ozen, S., Pistorio, A., Iusan, S., Bakkaloglu, A., Herlin, T., Brik, R., … & Ruperto, N. Clinical features and long-term outcome of Henoch–Schönlein purpura in children: a multicenter study. Rheumatology International. 2019;39:1111–1119.
2. Chaitanya, V. R., Lal, A., & Singh, S. Autonomic nervous system involvement and health-related quality of life in pediatric Henoch–Schönlein purpura. Pediatric Rheumatology Online Journal. 2021;19:118.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

3. Oni, L., & Sampath, S. Childhood IgA Vasculitis (Henoch–Schönlein Purpura)—Advances and Knowledge Gaps. Frontiers in Pediatrics. 2019;7:257.
4. Demir, S., Candan, C., & Turhan, P. Henoch–Schönlein Purpura/IgA Vasculitis in Children and Risk Factors for Renal Involvement. Acta Medica. 2021;585.
5. Shomuradova, K., & Yuldasheva, F.U. (2026). Influence of air pollution level on the incidence and severity of pneumonia in children. Web of Medicine: Journal of Medicine, Practice and Nursing.
6. Podraza Z., Poplicha K., Ufniarski T., Ucieklak J., Łysiak N., & Mizerska-Wasiak M. Laboratory findings and clinical features in IgA vasculitis: identifying predictors of kidney involvement and disease relapse in pediatric patients // *Journal of Clinical Medicine*. 2025;14(9):3055. doi:10.3390/jcm14093055.
7. 4. Zhou J., Nie M., Song Z., & Shen X. The health-related quality of life in children with IgA vasculitis // *Frontiers in Pediatrics*. 2025;13:1534687. doi:10.3389/fped.2025.1534687.
8. 5. Sağlam M.K., & Ergüven M. Demographic, clinical, and laboratory characteristics of pediatric IgA vasculitis: a retrospective five-year single-center experience // *Journal of Clinical Medicine*. 2026;15(4):1508. doi:10.3390/jcm15041508.
9. 6. Muratkasimova A., & Amonova N. Геморрагический васкулит у детей // *Central Asian Journal of Education and Innovation*. 2023;2(3 Part 2):12–17.
10. 7. Yurchenko A.S., Streltsova V.V., Zhitenyova A.I., Zakirov M.M., & Nastausheva T.L. Геморрагический васкулит у детей за пятилетний период с 2019 года по 2023 год с учетом новой коронавирусной инфекции // *Молодежный инновационный вестник*. 2024;13:371–373.
11. 8. Болаларда геморрагик васкулитнинг рецидив шакли: клиник, лаборат ва гемостаз тизими хусусиятлари // *Медицинский журнал Узбекистана*. 2025;1(4):118–123.
12. 9. Ozen S., et al.; Cunningham N. Recurrent immunoglobulin A vasculitis in children and adolescents: prevalence and associated risk factors // *Pediatric Rheumatology*. (Date uncertain — available as PMC article on pediatric IgAV complications).
13. Saulsbury, F. T. Henoch–Schönlein purpura // Current Opinion in Rheumatology. 2001;13(1):35–40
14. Trapani, S., Micheli, A., Grisolia, F., et al. Henoch–Schönlein purpura in childhood: epidemiological and clinical analysis // Clinical and Experimental Rheumatology. 2005;23(3):369–373.
15. Ozen, S., Pistorio, A., Iusan, S., et al. Pediatric IgA vasculitis (Henoch–Schönlein purpura): long-term outcome and predictors // Rheumatology International. 2019;39(7):1111–1119.
16. Zhou, J., Nie, M., Song, Z., Shen, X. Health-related quality of life in pediatric IgA vasculitis // Frontiers in Pediatrics. 2025;13:1534687.
17. Podraza, Z., Poplicha, K., Ufniarski, T., et al. Clinical features and predictors of complications in pediatric IgA vasculitis // Journal of Clinical Medicine. 2025;14(9):3055.
18. Sağlam, M. K., Ergüven, M. Demographic and clinical characteristics of pediatric IgA vasculitis: five-year experience // Journal of Clinical Medicine. 2026;15(4):1508.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5