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ORIGINAL RESEARCH
Pediatric Rheumatology

Exploring attitudes and practice of Turkish pediatric rheumatologists toward childhood vaccination: Online survey study

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ABSTRACT

Objective: To investigate the vaccination practices and attitudes of Turkish pediatric rheumatologists toward the Turkish national childhood immunization program.

Material and Methods: A voluntary online survey was developed to ascertain clinicians' views and practices regarding childhood vaccination schedules in pediatric rheumatology. The survey was emailed to participants between August and September 2024.

Results: Two-thirds of the participants thought that the vaccination status of patients should be evaluated both during follow-up and at the time of diagnosis. B-cell depleting therapy, intravenous immunoglobulin, and moderate/high-dose corticosteroids were the top three drugs considered contraindicated for both inactivated and live vaccines. A four-week break in immunosuppression was often used before and after live vaccines, but not for inactivated ones. While live vaccines were considered potential disease triggers by some clinicians (n=24; 35.8%), most (n=64; 89.5%) reported no disease activation after inactivated vaccinations. A strong desire for national vaccination guidelines was expressed by 89.6% of participants.

Conclusion: This study provides the first evaluation of the implementation of the national vaccination program for children with chronic rheumatic diseases, focusing on immunosuppressive treatments. Although most participants supported vaccination, hesitations regarding live and inactivated vaccines in patients under immunosuppressive treatment persist. National guidelines are needed to address these issues.

Keywords: Pediatrics; perception; rheumatology; vaccination.

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Türk pediatrik romatologlarının çocukluk aşılarına yönelik tutum ve uygulamalarının incelenmesi: Çevrimiçi anket çalışması

ÖZET

Amaç: Türk pediatrik romatologlarının Türk ulusal çocukluk aşı programına yönelik aşılama uygulamalarını ve tutumlarını araştırmak.

Gereç ve Yöntemler: Pediatrik romatolojide çocukluk aşı takvimlerine ilişkin klinisyenlerin görüşlerini ve uygulamalarını belirlemek amacıyla gönüllü bir çevrimiçi anket hazırlandı. Anket, katılımcılara Ağustos–Eylül 2024 arasında e-posta ile gönderildi.

Bulgular: Katılımcıların üçte ikisi, hastaların aşı durumunun sadece tanı sırasında değil, takip sırasında da değerlendirilmesi gerektiğini düşündü. B-hücresi tüketici tedavi, intravenöz immünoglobulin ve orta/yüksek doz kortikosteroidler, hem inaktive hem de aktif aşılar için kontrendike kabul edilen ilk üç ilaç olarak belirtildi. Canlı aşılar öncesinde ve sonrasında immünsüpresyonda sıklıkla dört haftalık bir ara verilmesi önerilmesine rağmen, inaktive aşılar için bu geçerli değildi. Bazı klinisyenler (n=24; %35.8) canlı aşıları kronik romatizmal hastalıklar için potansiyel tetikleyiciler olarak görse de, katılımcıların çoğunluğu (n=64; %89.5) inaktive aşılamalardan sonra hastalık aktivasyonu bildirmedi. Ulusal aşı gerekliliği, grubun büyük kısmı tarafından (%89.6) dile getirildi.

Tartışma: Bu çalışma, immünsüpresif tedavilere odaklanarak kronik romatizmal hastalığı olan çocuklar için ulusal aşılama programının uygulanmasının literatürdeki ilk değerlendirmesini ortaya koymuştur. Çoğu katılımcı aşılama konusunda teşvik edici olmasına rağmen, immünsüpresif tedavi altındaki hastalarda canlı ve inaktive aşılara yönelik tereddütler devam etmektedir. Bu sorunları ele almak için ulusal rehberlere ihtiyaç vardır.

Anahtar Kelimeler: Algı; aşılama; pediatri; romatoloji.

INTRODUCTION

Vaccination is one of the greatest public health achievements throughout the development of medical science, significantly reducing the mortality and morbidity rates from many common infectious diseases (1–3).

The routine childhood vaccination program recommended by the Ministry of Health in Türkiye includes preventive vaccination against many infectious diseases. The child's vaccination program begins with the first dose of the Hepatitis B vaccine administered in the hospital at birth. Vaccination then continues at intervals, with the last dose given in the first grade of high school (4).

In a study of 2,018 parents from Israel, approximately 8% of participants reported that they had given their children childhood vaccinations but deviated from the recommended protocol (5). Studies on vaccine hesitancy have shown that 5–20% of children do not complete the recommended childhood vaccination schedule (6–10). Additionally, families of children with chronic diseases may have hesitations about vaccinations, and their treatments and disease activities can lead to schedule changes, making compliance difficult and potentially negatively affecting vaccination rates (11).

Immunosuppressive therapy is a cornerstone of treatment for many chronic rheumatic diseases in children (12–15). While these medications are essential for controlling inflammation and joint damage, they can also increase susceptibility to infections (16, 17). Vaccination is a critical component of preventive healthcare for all children, but it poses unique challenges for those with compromised immune systems (16, 18–20).

This study explores the vaccination practices and attitudes of Turkish pediatric rheumatologists towards the national childhood immunization program. The specific focus is on understanding how clinicians approach vaccination in children receiving immunosuppressive therapy. By examining the current practices and knowledge gaps, we aim to contribute to developing evidence-based recommendations for vaccinating immunocompromised children.

MATERIAL AND METHODS

Study Design

A cross-sectional, nationwide online survey was conducted among pediatric rheumatologists practicing in Türkiye.

Participants

All pediatric rheumatologists registered with the Turkish Association of Pediatric Rheumatology were invited to participate in the study. Inclusion criteria were: (1) actively continuing or having completed pediatric rheumatology fellowship training, and (2) current practice in Türkiye. Exclusion criteria were: (1) refusal to participate, and (2) incomplete survey responses.

Data Collection

A structured electronic questionnaire was developed to collect data on demographic characteristics, vaccination knowledge, attitudes, and practices (Supplementary file 1). The questionnaire included:

- Sociodemographic information (age, gender, years of experience, highest academic degree).
- Attitude questions regarding approaches to monitoring patients' vaccination status and evaluation of seroconversion.
- Questions exploring clinical experiences and views on adverse events and disease flares due to active and inactive vaccine administrations.

- Questions seeking opinions on the challenges of administering active and inactive vaccines to patients receiving immunosuppressive drugs such as intravenous immunoglobulin (IVIG), biological disease-modifying antirheumatic drugs (bDMARD), conventional disease-modifying antirheumatic drugs (cDMARD), corticosteroids (CS), etc.

The questionnaire was pilot-tested among a group of pediatric rheumatologists to assess clarity and feasibility. The survey was emailed to participants between August and September 2024, and responses were collected.

Data Analysis

Statistical analyses were conducted using IBM SPSS Statistics version 26.0 (Released 2019; IBM Corp; Armonk, New York, United States). Descriptive statistics were employed to summarize participant demographics. Frequency distributions and percentages were calculated for categorical variables. To examine the associations between demographic factors and knowledge, attitude, and practice scores, chi-square tests or Fisher's exact tests were used for categorical variables, while t-tests or ANOVA were applied to continuous variables.

Ethical Considerations

The study was approved by the local Institutional Review Board (No: 2796181). Participation in the study was voluntary, and informed consent was obtained from all participants. The study complied with the Declaration of Helsinki. All data were collected and analyzed anonymously.

RESULTS

Characteristics of Participants

A total of 67 pediatric rheumatologists participated in the study across Türkiye, with 65 (97%) from training and research hospitals and 2 (3%) from private institutions. The median age of the group was 38 (IQR: 36–45) years, and most participants were female (73.1%). Demographics and other characteristics are illustrated in Table 1.

Table 1. Demographic data of the participants

Characteristics	n (%)
Gender (F/M)	49/18 (73.1/26.9)
Age (median), (IQR)	38 (36–45)
Type of medical institution	
Training and research hospital	65 (97)
Private institution	2 (3)
Years of working experience	
<5	20 (29.9)
5–10	21 (31.3)
>10	26 (38.8)
Highest education level	
Associate professor/professor	24 (35.8)
Specialist	20 (29.9)
Fellow	23 (34.3)

F: Female; M: Male; IQR: Interquartile range.

Approaches and Attitudes Towards Vaccination of Patients with Chronic Rheumatic Disease

Fourteen (20.9%) participants stated that they personally evaluate the vaccination status of patients in the pediatric rheumatology outpatient clinic, while consultation was most commonly requested from the department of social pediatrics (n=34; 50.7%). Approximately one-third of participants reviewed patients' vaccination status only at the time of diagnosis, while another third found it appropriate to review it annually. The majority of physicians (61.2%) indicated that any ongoing treatment does not preclude the administration of inactivated vaccines. For patients undergoing B-cell depletion therapy, 14 (20.9%) clinicians contraindicated inactivated vaccines, whereas 55 (82.9%) clinicians preferred to omit live vaccines entirely. Table 2 provides a summary of questions investigating clinicians' approaches to monitoring patients' vaccination status and their preferences for administering active-inactive vaccines according to patients' treatment status.

The most common concern regarding live vaccines was expressed for patients taking bDMARDs (n=31; 46.3%). This trend was also evident for patients receiving moderate- to high-dose CS and B-cell depleting agents (n=16; 22.4%) and those on a combination of bDMARD and cDMARD therapy (n=13; 19.4%). Four (6%) participants preferred low disease activity as a prerequisite for live vaccine administration, while three (4.5%) participants stated that even high disease activity should not be considered a contraindication for live vaccines.

A significant majority of participants (89.6%) supported the development of a national vaccination recommendation guideline that would complement the EULAR2021 guidelines.

Clinical Experiences of Pediatric Rheumatologists Regarding Vaccination of Their Patients

Sixty-four (95.5%) participants stated that they did not witness disease activation after inactivated vaccine administration. The remaining 3 (4.5%) clinicians reported disease activation in patients with juvenile idiopathic arthritis (JIA), granulomatosis with polyangiitis, and Immunoglobulin A vasculitis (IgAV). Overall, 7 (10.4%) participants expressed the view that inactivated vaccines could lead to disease flare-ups.

Out of the 24 participants who considered live vaccines as potential triggers for disease activation, 6 clinicians reported observing disease flare in their patients. Of these, 3 cases had juvenile systemic lupus erythematosus (jSLE), 1 had familial Mediterranean fever (FMF), 1 had juvenile idiopathic arthritis (JIA), and 1 had polyarteritis nodosa.

Table 2. Pediatric rheumatologists' attitudes to routine vaccination practices

Question	Options	n	%
How often do you inquire about and assess the vaccination status of your patients with chronic rheumatic disease?	Every 3 months	8	11.9
	Every 6 months	9	13.4
	Once a year	25	37.3
	Only at diagnosis	24	35.8
	Never	1	1.5
Under which treatment conditions would you contraindicate the use of inactivated vaccines in your patients?	B-cell–depleting therapy	14	20.9
	IVIG	15	22.4
	Medium/high dose CS	14	20.9
	bDMARD	3	4.5
	Always recommended	41	61.2
Under which treatment conditions would you contraindicate the use of live vaccines in your patients?	B-cell–depleting therapy	55	82.1
	IVIG	51	76.1
	Medium/high dose CS	54	80.6
	bDMARD	46	68.6
	cDMARD	24	35.8
What is the optimal treatment interruption period prior to live vaccine administration for immunosuppressed patients?	2 weeks	4	5.9
	1 month	17	25.3
	3 months	12	17.9
	6 months	3	4.5
	Never	6	8.9
What is the recommended post-live vaccine treatment delay for immunosuppressed patients?	2 weeks	7	10.4
	1 month	30	44.7
	3 months	6	8.9
	6 months	2	2.9
	Never	3	4.5
What is the optimal treatment interruption period prior to inactive vaccine administration in immunosuppressed patients?	2 weeks	13	19.4
	1 month	4	5.9
	Never	47	70.1
What is the recommended post-inactive vaccine treatment delay for immunosuppressed patients?	2 weeks	13	19.4
	1 month	8	11.9
	3 months	1	1.5
	Never	41	61.2

bDMARD: Biological disease-modifying antirheumatic drug; cDMARD: Conventional disease-modifying anti-rheumatic drug; CS: Corticosteroid.

Participants reported adverse events in 6 (8.9%) patients during live vaccination, including five with juvenile idiopathic arthritis (JIA) and one with juvenile systemic lupus erythematosus (jSLE). Three of these patients were on bDMARDs, and three on cDMARD therapy. Among the JIA patients, two presented with blistered rash of chickenpox, two had a non-specific macular rash, and one developed a vasculitic rash. The jSLE patient experienced disease flare. Adverse events following inactivated vaccine administration were reported by 3 (4.5%) participants. One patient on bDMARD therapy experienced convulsions, another on cDMARD had a local reaction, and the third on a bDMARD-cDMARD combination reported myalgia. No life-threatening adverse events were reported.

Perspectives on Vaccines Beyond Routine Immunization and Seroconversion

The vast majority of participants reported recommending seasonal influenza (n=58; 86.6%) and HPV vaccines (n=55;

82.1%), which are not yet included in the Turkish routine immunization schedule, to their patients. Forty-two (62.7%) clinicians recommended meningococcal/pneumococcal prophylaxis prior to rituximab treatment.

When asked about follow-up of vaccinated patients, about three-quarters of the respondents indicated that they monitored for seroconversion (n=51; 76.1%). Hepatitis B was the most common vaccine for which seroconversion was assessed (n=49; 73.1%). One-third of clinicians (n=20) also monitored for seroconversion following MMR, VZV, and HAV vaccinations.

Comparison of Academic Degrees for the Attitudes

The majority of specialists (90%) routinely assessed patient vaccination status at diagnosis and then annually. Among fellows and seniors, one-third favored a more frequent evaluation every 3–6 months, while the remainder followed the same annual assessment schedule as specialists (p=0.36). A high percentage of fellows (82.6%), seniors (70.8%), and specialists (90%) indicated that the use of rituximab was the primary motivation for avoiding non-live vaccines. Both fellows and specialists identified medium-to-high dose CS and IVIG treatments as barriers to administering inactivated vaccines. This view was shared by two-thirds of senior physicians (p=0.18, p=0.2 for medium-to-high dose CS and IVIG, respectively). In all academic subgroups, live vaccines were avoided most frequently in patients receiving IVIG, medium-to-high dose CS, bDMARDs, or rituximab treatment (Fig. 1).

Approximately half of all groups had a positive opinion about interrupting immunosuppressive therapy for one month after live vaccine administration. While one-third of the seniors agreed on a one-month break before administering a live vaccine, 3 (13%) fellows had a positive opinion on this issue. Two-thirds of participants in all groups reported that they did not interrupt immunosuppressive therapy before or after inactivated vaccination.

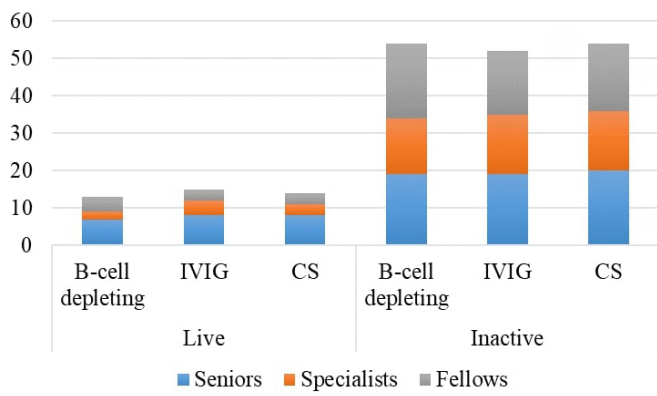

Figure 1. Participants' perspectives on treatments they consider contraindicated for active and inactive vaccination.

IVIG: Intravenous immunoglobulin; CS: Corticosteroids.

DISCUSSION

This study provides insights into the vaccination practices and perspectives of pediatric rheumatologists in Türkiye on routine childhood vaccinations. Our findings highlight significant variation in vaccine administration among healthcare providers caring for chronic pediatric rheumatic diseases. Additionally, the results suggest that clinicians view inactivated vaccines as safer than live vaccines for children with chronic rheumatic diseases.

The widespread recognition among clinicians of the importance of vaccinating patients with autoimmune/inflammatory rheumatic diseases is encouraging (18–20). Nevertheless, evidence regarding the safety and immunogenicity of both live and inactivated vaccines in autoimmune/inflammatory rheumatic diseases remains an area of active research. While inactivated vaccines have been shown to be safe for children with chronic rheumatic diseases, their long-term effectiveness is still uncertain. The compromised immune function and immunosuppressive treatments commonly used in these patients likely hinder the development of protective antibodies (10, 18). The high rate of live vaccine avoidance in patients on immunosuppressive therapies reflects a cautious approach; however, it may also indicate a lack of specific recommendations tailored to this patient population. In line with the literature, our study revealed that although inactivated vaccines were clearly preferred with greater confidence, there are reservations about both live and inactivated vaccines. The variability in vaccination practices, particularly regarding live vaccines, underscores the need for clear, evidence-based guidelines.

The reported rates of disease activation and adverse events following vaccination, although relatively low, warrant further investigation. A randomized trial found the measles-mumps-rubella booster to be well-tolerated in JIA patients, including those on methotrexate and bDMARDs, with no serious side effects or increased disease activity observed in the year following vaccination (21). Research on children with dysregulated immune systems indicates that varicella (chickenpox) vaccines are generally safe. While most children developed immunity, some experienced mild rash, and one required medical treatment. Notably, although the vaccine was effective for many, a small number of children still contracted chickenpox (22–24). Similar to previous studies, pediatric rheumatologists in Türkiye also observed chickenpox rash in their patients. However, no serious side effects were observed, and only one patient experienced disease activation.

Prospective studies with larger sample sizes are necessary to establish definitive associations between specific vaccines, immunosuppressive therapies, and clinical outcomes. The reported adverse events highlight the importance of careful monitoring of vaccinated patients, especially those on immunosuppressive medications.

Various factors, including differences in national immunization programs, parental attitudes, vaccination coverage rates, and healthcare provider approaches, result in significant variation in vaccination practices worldwide. Consequently, establishing consistent and standardized vaccination guidelines for children

with chronic rheumatic diseases receiving immunosuppressive and immunomodulatory therapies poses a global challenge. According to our study, regarding the assessment of vaccination status, one-third of fellows and seniors preferred to conduct an evaluation every 3–6 months, while the majority of specialists (90%) chose to assess vaccination status at the time of diagnosis and annually thereafter. This discrepancy might be explained by different work environments. Specialists often work independently, whereas fellows collaborate with seniors in research institutes, allowing for more frequent and comprehensive patient assessments.

While one-third of the seniors agreed on a one-month break before administering a live vaccine, only 3 (13%) fellows had a positive opinion on this issue. Fellows and seniors were more likely to advocate for more frequent vaccination assessments and to express concerns about the impact of immunosuppressive therapies on vaccine efficacy. These findings suggest a knowledge gap that could be addressed through targeted educational interventions. The strong support for a national vaccination guideline aligns with the recommendations of the EULAR 2021 guidelines. A standardized approach would enhance consistency in vaccine management, improve patient outcomes, and facilitate research on vaccine efficacy and safety in this vulnerable population (25).

Study Limitations

While this study provides valuable information, it has some limitations. The cross-sectional design precludes causal inferences, and the reliance on self-reported data may introduce recall bias. Furthermore, the sample size, although representative of pediatric rheumatologists in Türkiye, may not be sufficient to detect rare adverse events.

In conclusion, our study highlights the variability in vaccination practices among Turkish pediatric rheumatologists nationwide and emphasizes the need for comprehensive vaccination guidelines tailored to children with rheumatic diseases. Further research is warranted to investigate optimal vaccination strategies for this population, including the role of immunosuppressive therapy interruption and the monitoring of vaccine efficacy and safety. By addressing these knowledge gaps and implementing evidence-based guidelines, we can improve vaccination coverage and outcomes for children with rheumatic diseases. Based on the results of our study, it is planned to develop up-to-date vaccination guidelines for pediatric rheumatology patients through further research using the Delphi method.

Ethics Committee Approval: The İstanbul University Clinical Research Ethics Committee granted approval for this study (date: 15.08.2024, number: 2796181).

Authorship Contributions: Concept – ÖA, FGD, GKK, NAA; Design – ÖA, FGD, GKK, NAA; Supervision – ÖA, FGD, GKK, NAA; Fundings – ÖA, FGD, GKK, NAA; Materials – ÖA, FGD, GKK, NAA; Data collection and/or processing – ÖA, FGD, GKK, NAA; Analysis and/or interpretation – ÖA, FGD, GKK, NAA; Literature review – ÖA, FGD, GKK, NAA; Writing – ÖA, FGD, GKK, NAA; Critical review – ÖA, FGD, GKK, NAA.

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Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Yazma Yardımı için Yapay Zeka Kullanımı: Beyan edilmedi.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastaların ailelerinden alınmıştır.

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