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Original Research Article

Knowledge, Attitude and Practice towards Allergen specific Immunotherapy in Parents with Children having Allergic Rhinitis

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Abstract:

Objectives: The present study was to evaluate the Knowledge, Attitude and Practice towards Allergen specific Immunotherapy in Parents with Children of rural as well as urban area having allergic rhinitis at tertiary care hospital.

Methods: Socio-demographic data were gathered from both children and parents. Information was included age, sex, height, weight, allergic disease history, residence, AR severity, and comorbidities (secretory otitis media, chronic nasosinusitis, bronchial asthma, allergic conjunctivitis). The knowledge dimension encompasses 18 questions, with 8 items on AIT knowledge, 3 items on AIT effect, and 7 items on treatment and prevention of complications of AIT. Except for Item 18 (1 point for 1–2 answer choices; 0 points for 3 or more), each question was scored as 1 point for yes answer and 0 points for no or unknown. The score range of 0–18 points.

Results: The mean age of children with AR was 7.024 ± 3.64 years old, and 148(74%) children had mild persistent AR. For comorbidities, allergic conjunctivitis 144(72%) and chronic nasosinusitis (32.5%) were more common in children with AR. Among the 200 participating parents, 124(62%) were female. The average age of parents was 36±4.64 years old. Most of the parents 112(52%) had an education level above high school, and 52(26%) parents were business and service personnel. The mean scores for knowledge and practice were 8.68 ± 4.26 and 13.74 ± 4.54, respectively. The median score of attitudes was 30. A total of 7(3.5%) parents reported a high knowledge level towards AIT for children with AR.

Conclusions: parents have moderate level of knowledge and practice of allergic rhinitis in children. So, there is need of educational programme to enhance the immunotherapy. We should also organise free heath checkup camp in rural as well as urban area to aware the parents of children regarding AR and also to addressing the identified barrier and misconception of the management of allergic rhinitis for better treatment outcome.

Keywords: Knowledge Attitude and Practice, Allergic Rhinitis, Immunotherapy.

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Introduction

Allergic rhinitis is a nasal disorder and an IgE-mediated with induced inflammation of the nasal mucosal membranes in response to allergen exposure [1]. It is a common public health problem, impact on patient's health quality and socio economy [2]. Despite these many patients do not seek timely and appropriate medical interventions from specialist [2,3]. It may be associated with allergy of the sinuses, larynx, pharynx, ear, eye, lungs and skin in various combinations [3]. House dust mites mainly include Dermatophagoides pteronyssinus, D. farinae and Euroglyphus maynei [4]. They are non-parasitic microscopic bugs that live on desquamated dead skin cells from humans and pets. They prefer warm and moist environments and are found in bedding, linens, carpets and furniture [5].

Although the mite's exoskeleton can contribute to the allergic reaction, the main allergens are found in the mite's faecal pellets [6,7]. Each mite produces about 20 pellets daily, each the size and weight of a pollen grain.5 6 Therefore, they are easily inhaled and can cause sensitisation of the respiratory tract mucosa, leading to epithelial permeability and the movement of the mite's antigens to antigen-presenting dendritic cells [6,7].

In complicated allergic rhinitis, there may be associated sleep apnea, eustachian tube dysfunction, otitis media, palatal abnormalities and dental problems [8]. Diagnosis of allergic rhinitis was

mainly based on the clinical history and physical examination in developing countries due to lack of sophisticated in vitro and in vivo tests equipment. This is to determine eosinophilia (serum or nasal) and total serum IgE [9]. There are various methods of management of allergic rhinitis which involves health education, assurance, allergen avoidance, pharmacotherapy (antihistamine, and steroid) and immunotherapy [10]. There is paucity of literature on knowledge, attitude and practice on allergic rhinitis in children in developing countries. To improve childhood allergic rhinitis management, an assessment of parent knowledge, attitude and practice is a significant requirement in its prevention, early diagnosis and management. Objectives of the present study was to evaluate the Knowledge, Attitude and Practice towards Allergen specific Immunotherapy in Parents with Children having allergic rhinitis at tertiary care hospital.

Material & Methods

The present study was conducted in the Department of Pediatrics, Jan Nayak Karpoori Thakur Medical College and hospital, Madhepura, Bihar, India during a period from July 2024 to October 2024.

Study design, setting, and participants: A total of 200 parents of children with diagnosed with AR were included in the study.

Inclusion criteria were (1) children diagnosed with AR, (2) those receiving AIT, and (3) parents volunteering to participate in the study.

The exclusion criteria were (1) unwillingness to participate in the study, (2) inability to complete the questionnaire even with assistance, (3) questionnaires containing obvious logical errors, and (4) selection of the same option for all items of the questionnaire.

Questionnaire: Socio-demographic data were gathered from both children and parents. For children, information included age, sex, height, weight, allergic disease history, residence, AR severity, and comorbidities (secretory otitis media, chronic nasosinusitis, bronchial asthma, allergic conjunctivitis).

For parents, data encompassed age, sex, educational level, occupation type, living condition, income, the way to get information, family history of allergic rhinitis, and family history of other allergic diseases.

The questionnaire was designed based on allergic rhinitis [11]. The initial draft was revised according to the opinions of Pediatric allergy specialists.

The knowledge dimension encompasses 18 questions, with 8 items on AIT knowledge, 3 items on AIT effect, and 7 items on treatment and prevention of complications of AIT. Except for Item 18 (1 point for 1–2 answer choices; 0 points for 3 or more), each question was scored as 1 point for yes answer and 0 points for no or unknown. The score range of 0–18 points. The higher the score, the better AIT knowledge, and the score ≥ 14 is considered well AIT knowledge [12]. The attitude dimension included 7 questions using a five-point Likert scale that ranges from "completely disagree" (1 point) to "completely agree" (5 points). Scores in this dimension range from 7 to 35 points, where higher scores indicate a more accurate attitude towards AIT. The practice dimension included 4 questions, using a five-point Likert scale, from "almost never" (1 point) to "always" (5 points), with a score range of 4–20 scores. Higher scores indicate more effective practical engagement in managing AR.

Statistical Analysis: Data was analysed by using latest version of SPSS software. Mean and Standard deviations were observed. P-value was taken less than or equal to 0.05 ($p \leq 0.05$) for significant differences.

Results

Characteristic of parents and children: The mean age of children with AR was 7.024 ± 3.64 years old, and 148(74%) children had mild persistent AR. For comorbidities, allergic conjunctivitis 144(72%) and chronic nasosinusitis (32.5%) were more common in children with AR.

Among the 200 participating parents, 124(62%) were female. The average age of parents was 36±4.64 years old. Most of the parents 112(52%) had an education level above high school, and 52(26%) parents were business and service personnel. Parents primarily 144(72%) obtained AIT information from doctors.

Knowledge, attitude, and practice towards AIT among parents: The mean scores for knowledge and practice were 8.68 ± 4.26 and 13.74 ± 4.54, respectively. The median score of attitudes was 30. A total of 7(3.5%) parents reported a high knowledge level towards AIT for children with AR.

Table 1: Characteristics of children with AR

Variables	Total (n=200)
Children age, years, Mean (±SD)	7.024±3.64
Children sex, n (%)	
Female	72(36%)
Male	128(64%)
Children height, m, Mean (±SD)	1.42±0.22

Children weight, kg, Mean (±SD)	26.22±7.45
Children BMI, kg/m^2, Mean (±SD)	15.12±1.86
Children history of allergic disease, n (%)	
No	157(78.5%)
Yes	43(21.5%)
Children residence, n (%)	
City	132(66%)
Village	68(34%)
Child AR severity, n (%)	
Mild intermittent	32(16%)
Mild persistence	148(74%)
Moderate to severe intermittency	20(10%)
Length of AIT treatment, Mean (±SD)	57.5±41.42
Children secretory otitis media, n (%)	
No	198(99%)
Yes	2(1%)
Children chronic nasosinusitis, n (%)	
No	135(68.5%)
Yes	65(32.5%)
Children bronchial asthma, n (%)	
No	194(97%)
Yes	6(3%)
Children allergic conjunctivitis, n (%)	
No	56(28%)
Yes	144(72%)
Children other diseases, n (%)	
No	163(81.5%)
Yes	37(18.5%)

Table 2: Characteristics of parents whose children have AR

Variables	**Total (n=200)**
Parents age, years, M	36.00±4.64
Parents sex, n (%)	
Female	124 (62%)
Male	76(38%)
Parents education, n (%)	
Above high school	112(56%)
High school and below	88(44%)
Parents occupation type, n (%)	
Business, service personnel	52(26%)
Clerical and related personnel	34(17%)
Others, Farmer	68(34%)
Production, transportation equipment operators and related personnel	20(10%)
Professionals	16(8%)
Unknown	10(5%)
Parents children live together, n (%)	
No	16(8%)
Yes	184(92%)
Income of family (Socio-economic status, n (%)	
Upper class	4(2%)
Upper middle class	28(14%)
Middle class	72(36%)
Lower middle class	76(38%)
Lower class	20(10%)
Parents obtain information way, n (%)	
Doctor	144(72%)

Friend or Parents	42(21%)
Others	34(7%)
Parents family history of allergic rhinitis, n (%)	
No	136(68%)
Yes	64(32%)
Parents family history of other allergic diseases, n (%)	
No	122(61%)
Yes	78(39%)

Discussions

Allergens are foreign protein that can induce allergic reactions. Allergens may either be outdoor or indoor allergens [13]. Outdoor allergens include pollens, fungal spores and dust particles. Indoor allergens include house dust mites, animal allergens, moulds, fungi, insect allergens and rodent allergens. Others were food intake, temperature change and humidity. Clinical manifestations of allergic rhinitis include sneezing, itching (nose, ears, palate, eye), catarrh, postnasal drip, nasal blockage, anosmia, headache, earache, hearing impairment, tearing, red eyes, fatigue and malaise [8].

In the present study, our findings indicate that parents had a moderate level of knowledge and practice regarding AIT, alongside a notably positive attitude toward this therapy. A higher knowledge score was associated with a positive attitude, while factors such as bronchial asthma in children, other diseases, and a family history of AR negatively influenced the attitude toward AIT. Importantly, a positive attitude was related to higher adherence rates to AIT among children, suggesting a crucial relationship between parental perception and clinical outcomes in allergen management.

A study conducted in Ningbo reported that parents of children with AR had poor knowledge but positive attitudes and proactive practices [14], which aligns with our findings regarding parental KAP toward AIT for children with AR. Fan et al. [15] reported that patients with AR had inadequate AIT knowledge, negative attitudes, and proactive practices, this may be because these patients experienced persistent symptoms, treatment failures, or a lack of immediate relief from AIT, with cumulative frustration leading to a more negative perception of the therapy. While our study found parents had positive attitudes towards AIT, this may be due to increased awareness campaigns in recent years, a surge in AIT usage in practice, or regional differences in access to information regarding allergy management.

Our study identified several factors influencing the attitude score towards AIT among parents. The presence of bronchial asthma in children was negatively correlated with the attitude scores, suggesting that parents of asthmatic children may experience greater anxiety or skepticism toward additional therapies such as AIT [16]. This is supported by literature indicating that parents often prioritize immediate, more traditional treatments over immunotherapy due to concerns about their children's respiratory health [17]. Additionally, the presence of other comorbidities was associated with lower attitude scores, likely because children with multiple diagnoses have multifaceted healthcare needs, leaving parents feeling overwhelmed and less optimistic about AIT as a viable option [18]. Moreover, a family history of AR significantly influences parental attitudes, as many parents may hold preconceived notions regarding the efficacy of AIT based on their own experiences or familial narratives. Parental beliefs about the heritability of allergic conditions can shape their views toward preventive measures, including AIT [19]. Furthermore, treatment accessibility is a key external factor influencing parental attitudes toward AIT [20]. Limited healthcare accessibility (due to uneven geographic distribution), the financial burden of long-term treatment, and restricted access to health information collectively increase parents' perceived barriers to AIT [21]. Disease burden, differences in socioeconomic status, and parental anxiety are also potential factors affecting parental attitudes toward AIT. When the disease burden is relatively mild, parents tend to maintain the status quo rather than pursue AIT, which requires long-term treatment [19]. Low-income families, constrained by economic limitations and cognitive barriers, are less likely to proactively choose AIT [20]. Parental anxiety can amplify perceived treatment risks, and out of a protective instinct for their children, this may further strengthen resistance to AIT [22].

The positive correlation between attitude and the practice scores highlights the critical role of parental perceptions in health-related behaviors. Parents who held a more favorable view of AIT were more likely to engage in therapy for their children, suggesting that attitudes directly translate into adherence. This aligns with the Health Belief Model, which posits that individuals are more likely to engage in health-promoting behaviors when they perceive high benefitst and low risks associated with the behavior [23]. Possible reasons for this relationship may include enhanced communication with healthcare providers, which fosters a better understanding of AIT's benefits and reduces fears regarding side effects. Furthermore, parents who feel supported and

informed—particularly those who receive clear, comprehensive information about AIT—are more likely to adhere to treatment protocols and pursue therapy actively [24]. Thus, initiatives aimed at improving parental attitudes could lead to higher engagement in AIT, which may ultimately translate to better health outcomes for children with AR.

Given that moderate AIT knowledge was associated with a positive attitude toward treatment, parent-targeted educational interventions could be crucial for improving both understanding and practice. Implementing structured educational programs that focus on the benefits, risks, and expected outcomes of AIT could empower parents, leading to increased adherence and, consequently, improved management of AR in children [25].

Allergen immunotherapy has been used with success in allergic rhinitis, atopic dermatitis, and asthma (1). Allergen immunotherapy can be generally applied in two distinct forms: i. the patient receives a subcutaneous injection (subcutaneous immunotherapy = SCIT), given at a clinical site, or ii. sublingual or oral ingestion of an AIT in an outpatient setting [25,26]. The adverse reactions to AIT include local side effects such as induration in the field of application, itching and hyperemia, or systemic side effects such as shortness of breath, urticaria, hypotension, abdominal pain, and vomiting [25-28). Anaphylaxis occurs in an allergic subject upon inadvertent exposure to the offending allergen, to which the patient had been previously sensitized to. Unsurprisingly, immunotherapy can lead to anaphylaxis, since the allergen is directly administered to the patient (25,27-29].

Given this compromise, SCIT is implemented only in tertiary care units well-prepared with the emergency care resources; patients are maintained under observation for a certain time following injection to watch for any possible reactions [25,30]. There are anecdotal descriptions of anaphylaxis following SCIT occurring even after discharge from the facility, or with oral AIT, when subjects are outside a clinical environment [27,31].

Conclusions

The present study concluded that the parents have moderate level of knowledge and practice of allergic rhinitis in children. So, there is need of educational programme to enhance the immunotherapy. We should also organise free heath checkup camp in rural as well as urban area to aware the parents of children regarding AR and also to addressing the identified barrier and misconception of the management of allergic rhinitis for better treatment outcome.

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