

ORGANIZATION OF MEDICAL CARE FOR CHILDREN WITH SEASONAL ALLERGIC RHINOSINUSITIS: A THREE-STAGE SCREENING AND DIAGNOSTIC ALGORITHM

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Abstract

Aim. To describe the methodology and protocol of a three-step patient pathway developed for detecting seasonal allergic rhinosinusitis (SAR) in primary-school-aged children: documentary screening at the general education school level, an intermediate local-pediatrician review, and a verifying face-to-face otorhinolaryngologist examination.

Material and methods. At the first step, electronic school attendance-register data coded as absence for “acute respiratory viral infection (ARVI)/influenza” are analyzed; a two-component recurrence filter (inter-seasonal and intra-seasonal) is applied to the dataset, after which parents of children meeting the at-risk criterion are sent a standardized six-item questionnaire. At the second step, the local pediatrician receives an automatically generated referral summarizing the absence history and questionnaire results; the pediatrician's role is limited to excluding conditions requiring urgent care and referring the child for a full allergological work-up — the pediatrician does not independently establish a SAR diagnosis. At the third step, the otorhinolaryngologist performs a face-to-face clinical-instrumental and laboratory-immunological examination comprising nasal endoscopy, skin scarification/prick testing, total and specific IgE, anterior active rhinomanometry, and paranasal sinus ultrasonography; the final diagnosis is established only when at least two objective positive findings are present.

Results. The structure and transition criteria between the three steps of the patient pathway are presented, together with the roles and authority limits of each participant (parent — school nurse — local pediatrician — otorhinolaryngologist) and the mandatory rule for objective diagnostic verification. Quantitative indicators of underdiagnosis and of the pathway's diagnostic yield are at the data-accrual stage for the prospective cohort and will be reported in a separate publication once enrolment is complete.

Conclusion. A sequential three-step pathway combining documentary screening, a pediatrician triage function, and mandatory objective otorhinolaryngologist verification provides a structured, reproducible route for detecting SAR in children within the general education setting, clearly separating the function of at-risk selection from the function of diagnosis.

Keywords: seasonal allergic rhinosinusitis, children, school-based screening, pediatrician triage, otorhinolaryngologist verification, underdiagnosis.

1. Introduction

Seasonal allergic rhinosinusitis (SAR) in schoolchildren is frequently misclassified as recurrent acute respiratory viral infection (ARVI) in outpatient practice, since nasal congestion, rhinorrhea, and sneezing overlap substantially between the two conditions and repeated school absence is, by default, coded administratively as infectious rather than allergic in origin [1,2]. Detecting SAR at the population level therefore requires a pathway that can (a) flag children plausibly affected using data already routinely collected by schools, (b) route flagged children efficiently through primary care without overburdening pediatricians with unfiltered referrals, and (c) subject every candidate case to objective, guideline-concordant confirmation before a diagnostic label is applied [3,4].

A single free-standing screening questionnaire, however well validated, does not by itself satisfy this requirement: international rhinitis guidance is explicit that a positive screen constitutes grounds for referral, not for diagnosis, and that allergic rhinosinusitis in children should be confirmed by clinical, endoscopic, and laboratory-immunological assessment [3,4]. Conversely, routing every recurrently absent child directly to a specialist is neither efficient nor consistent with the graded structure of primary-to-specialist referral used in most pediatric health systems [5]. These two constraints motivated the design, within a broader dissertation research project on the diagnosis and treatment of SAR in schoolchildren, of an explicit three-step pathway — school-based documentary screening, pediatrician triage, and otorhinolaryngologist (ENT) verification — in which each step has a clearly bounded scope of authority. The present article describes this pathway as a methodological and protocol contribution, independent of the quantitative underdiagnosis and diagnostic-yield findings that will be reported once prospective cohort enrolment is complete.

Aim

To describe the structure, transition criteria, and division of responsibility of a three-step patient pathway — school-based screening, pediatrician review, and otorhinolaryngologist verification — developed for detecting seasonal allergic rhinosinusitis in schoolchildren.

2. Materials and Methods

Step 1 — school-based documentary screening. Daily attendance records of children in grades 1–4 at three general education schools are reviewed for absences coded as “ARVI/influenza.” A two-component recurrence filter is applied to this dataset: an inter-seasonal component, capturing recurrence of the same coded absence across comparable calendar windows in successive years, and an intra-seasonal component, capturing 2 episodes within a single calendar month or 3 episodes within one season. Children meeting either component are classified as at-risk. Their parents then receive a standardized six-item questionnaire (recurrence of the episode within the season and across years; presence of fever; nasal/ocular itching and paroxysmal sneezing; association of symptoms with outdoor exposure; parental history of allergy/asthma; and impact on the child’s sleep and schoolwork), completed remotely at the time an absence note is issued rather than requiring an in-person school visit. Responses are automatically scored (0–6); at the intermediate threshold (3 of 6 positive items) the school nurse’s dashboard generates a notification, and at the higher threshold (5 points) a priority referral, with the absence history and questionnaire results attached.

Step 2 — local pediatrician review. Once the referral threshold is reached, the local pediatrician receives a pre-populated referral summarizing the child’s absence history and questionnaire responses, rather than an unstructured request for evaluation. The pediatrician’s scope at this step is deliberately narrow and explicitly does not include establishing or excluding a SAR diagnosis: the task is limited to (a) excluding any acute condition requiring urgent medical attention and (b), in the absence of such a condition, forwarding the child to an otorhinolaryngologist for full allergological assessment. This division of labor is intended to prevent premature diagnostic labeling based on questionnaire data alone and to keep the primary-care step focused on triage rather than on definitive assessment [5].

Step 3 — otorhinolaryngologist (ENT) verification. Following pediatrician referral, the otorhinolaryngologist performs a standardized face-to-face examination comprising: clinical and allergological history-taking, with cardinal nasal symptoms (obstruction, rhinorrhea, itching, sneezing) scored on a 4-point severity scale (0 – absent to 3 – marked); anterior nasal endoscopy; anterior active rhinomanometry, performed before and after a standard decongestant test to assess reversibility of obstruction; paranasal sinus ultrasonography (echosinusoscopy), used specifically to distinguish

rhinosinusitis from isolated rhinitis, with radiography reserved for equivocal ultrasound findings; skin scarification/prick testing with household, epidermal, and pollen allergens, timed against a regional pollen calendar; and total and allergen-specific serum IgE. Peripheral eosinophil count and nasal cytogram are additionally recorded. A final diagnosis — true ARVI, isolated SAR, or SAR with a concomitant asthmoid component — is entered only when at least two independent objective findings are positive; this rule is enforced structurally in the supporting information system, so that a diagnosis of SAR cannot be recorded from questionnaire or history data alone, without face-to-face endoscopic and laboratory-immunological confirmation.

3. Results

The three-step pathway described above constitutes the completed structural output of this stage of the project: a documentary, attendance-based entry point requiring no additional data collection burden on schools beyond their existing administrative records; an explicitly bounded pediatrician triage step that filters referrals and excludes acute non-allergic presentations without assuming diagnostic authority; and a mandatory, multi-modality otorhinolaryngologist verification step that enforces a minimum evidentiary threshold before a diagnosis is recorded. The division of authority across the three steps — flagging (school/parent), triage (pediatrician), and diagnosis (otorhinolaryngologist) — is structurally distinct rather than overlapping, so that no single step can, by itself, generate a confirmed SAR diagnosis.

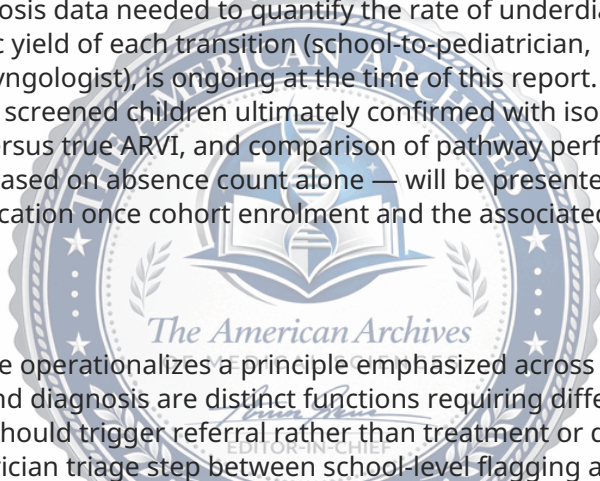
Enrolment into the prospective verification step, and the corresponding accumulation of paired screening-to-verified-diagnosis data needed to quantify the rate of underdiagnosis captured by this pathway and the diagnostic yield of each transition (school-to-pediatrician, pediatrician-to-otorhinolaryngologist), is ongoing at the time of this report. Quantitative findings — including the proportion of screened children ultimately confirmed with isolated SAR versus SAR with an asthmoid component versus true ARVI, and comparison of pathway performance against single-criterion screening based on absence count alone — will be presented as a separate original-research communication once cohort enrolment and the associated statistical analysis are complete.

4. Discussion

The pathway described here operationalizes a principle emphasized across current allergic rhinitis guidance: that screening and diagnosis are distinct functions requiring different levels of evidence, and that a positive screen should trigger referral rather than treatment or diagnostic labeling [3,4]. By inserting an explicit pediatrician triage step between school-level flagging and specialist verification, the pathway also reflects standard graded-referral logic used elsewhere in pediatric primary care, in which the primary-care physician's role is to exclude urgent or alternative pathology and to direct appropriate cases onward, rather than to adjudicate a specialist diagnosis [5]. This structure differs from screening protocols that route flagged children directly to a specialist without an intermediate primary-care step, an approach that risks either overloading specialist capacity or, conversely, encourages loosening of the specialist confirmation requirement under caseload pressure.

The requirement for at least two independent objective findings before a diagnosis is entered follows directly from the international consensus that neither symptom-based screening nor a single positive test (e.g., a positive skin test alone, in the absence of correlating symptoms and endoscopic findings) is sufficient to establish allergic rhinosinusitis in children [4]. Embedding this rule at the level of the information system, rather than relying solely on individual clinician discipline, is intended to make the requirement structurally difficult to bypass under time pressure or diagnostic uncertainty.

A limitation of the present description is that, as a protocol and pathway-structure report, it does not itself quantify the pathway's diagnostic yield, sensitivity of the school-level flagging step, or the proportion of referrals appropriately filtered at the pediatrician-triage step; these questions require the completed prospective cohort and will be addressed once enrolment and follow-up are finished. A further limitation concerns transferability: the specific recurrence thresholds and referral criteria described here were calibrated to a particular regional school setting and administrative data structure and would require local validation and adaptation before use in settings with different attendance-coding conventions or primary-care referral structures.



5. Conclusion

A three-step pathway combining school-based documentary screening, bounded pediatrician triage, and mandatory multi-modality otorhinolaryngologist verification provides a structured, reproducible route for detecting seasonal allergic rhinosinusitis in schoolchildren, in which the function of identifying an at-risk child is explicitly separated from the function of establishing a diagnosis. Prospective evaluation of the pathway's diagnostic yield at each transition, currently in progress, will determine its practical performance and any need for recalibration of referral thresholds before broader implementation.

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