

Frequency of complications of persistent rhinorrhoea in children

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Abstract

This study was performed to determine the frequency of complications (pharyngitis / tonsillitis/ sinusitis / otitis media) in children with persistent rhinorrhoea. Methods: Children aged 6 months to 12 years were enrolled as per inclusion criteria and follow up examination was done on day 3 and day 10. Tympanometry was done on 30th day to assess impedance hearing impairment. The rate of complications was compared between children with persistent rhinorrhoea and those with acute rhinorrhoea. Results: Out of 222 patients with persistent rhinorrhoea, 152 (68.5%) had pharyngitis, 47(21.2%), had tonsillitis, 79 (35.6%) had otitis media, 65 (29.2%) had lymphadenitis, 11 (5.0%) had sinusitis, 13 (5.9%) had acute lower respiratory tract infection (LRTI). Conclusion: The study demonstrated that children with persistent rhinorrhoea have significantly higher level of complications than patients with acute rhinorrhea. Hence, it is important to identify these children with high risk for complications.

Key words: Otitis media; Pharyngitis ;Rhinorrhoea; Sinusitis.

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Introduction

Persistent rhinorrhoea (running nose) is a common outpatient problem in children. The course of action varies from observation to antibiotics. Ballenger [1] states that secondary bacterial invasion may occur which prolongs the illness for 6 to 8 days, hence the purulence represents a complication of clear rhinorrhoea. Ferguson and Kendig [2] suggested that a secondary purulent bacterial rhinitis may follow a viral rhinitis. Review of available literature revealed no clinical trials to substantiate the suggested treatment. The major events predisposing to the developments of complications like pharyngitis, tonsillitis, sinusitis, otitis media, lower respiratory tract infections (LRTI) are viral upper respiratory tract infection (URTI) and allergic inflammation. The frequency with which viral URTI in children is complicated by secondary bacterial infections has not been estimated/documentated. This study was undertaken to determine the frequency of complications of such respiratory tract infections in children.

Materials and Methods

A cohort study was planned to compare the frequency of complications in children with persistent rhinorrhoea and acute rhinorrhoea. Children aged 6 months to 12 years of age attending OPD with rhinorrhoea were enrolled over one year. These children were divided in two groups; Group A and B. To qualify for the enrollment the subjects must have acute rhinorrhoea of <2days for group A (less exposed group) and persistent rhinorrhoea of >10 days for group B (more exposed group) with a history of wellness prior to enrollment. To begin with 500 patients were enrolled, 250 in each group. Children with h/o antibiotics administration within 48 hours, with craniofacial anomalies, illnesses requiring hospitalization or any other serious illness were excluded. Data was collected on age, sex, reason for seeing the physician, duration of nasal discharge prior to visit, presence of fever and medications used.

The children enrolled were subjected to complete physical and systemic examination including ENT examination by two residents each one from Paediatrics and ENT Department. All the patients were followed up on day 3, 10 and

30th. Tympanometry was done on 30th day to find out the impedance hearing impairment in patients who had abnormal tympanic membrane. Normal tympanogram demonstrate good mobility (compliance of middle ear system) with peak pressure at ambient atmosphere pressure while abnormal tympanogram is just flat without any pressure peak or measurable compliance. Oral consent was taken from parents/caregivers of every patient. Due clearance was taken from ethical committee for conducting this study. Sharma/ Jain

A simple rhinorrhoea was taken as the presence of clear nasal discharge whereas complicated rhinorrhoea was taken as rhinorrhoea associated with pharyngitis, tonsillitis, sinusitis, otitis media, LRTI. Pharyngitis was taken as congestion of pharyngeal wall. Tonsillitis was defined as congestion along with parenchymatous or follicular tonsillitis. Sinusitis was defined as facial or paranasal tenderness. Otitis media was defined as presence of abnormal tympanic membrane on otoscopic examination; presence of drainage from either ear during follow up period and abnormal tympanometry on 30th day. Patient is said to have acute LRTI if there was tachypnea; rales wheezing cyanosis; and/or chest indrawing. Complications were appropriately managed as indicated and if infection was suspected then appropriate antibiotic started. The complications in the two groups were compared using using X^2 test.

Results

Both the groups were comparable for sex, age and socio economic status. At enrollment there were 250 patients in group A and 250 patients in group B (Table I). Majority of children in both the groups were between the age group of 6 months to 5 yrs, 171 (68.5%) in group A and 170(68%) in group B. In group A 104(41.6%) patients were from upper lower class and 75 (30.1%) were from lower middle class whereas in group B 106(42.5%) patients were from upper lower and 79 (31.5%) patients were from lower middle class (Modified Kuppuswamy scale). 31(12.4%) patients from group A and 28(11.2%) patients from group B were lost to follow-up, hence excluded from the study. There was good correlation between both the residents in correlating symptoms and complications (Kappa statistics 0.75).

Table I: The summary of clinical history and Complications

Sr No.	Symptoms	Gp A n=250(%)	Gp B n=250(%)	p-value
1	Type of nasal discharge;			
	Clear	216(86.3)	96(38.3)	0
	Mucoid	23(9.1)	76(30.5)	0
	Purulent	11 (4.5)	77(31.0)	0
2	Sore throat	88 (35.1)	178(71.2)	0
3	Otitis media	11 (4.5)	42 (16.9)	0
4	Retrobulbar headache	05 (1.8)	15 (5.9)	0.022 (Fischer exact test)
5	Lymphadenopathy (jugu-lodiagastric)	18 (7.3)	80(31.9)	0
6	Ear ache	03 (0.9)	33(13.2)	0 (Fischer exact test)
7	Noisy breathing	21 (8.2)	62(24.7)	0
8	Cough	91 (36.5)	183(73.0)	0

9	Sleeping disturbances	18 (7.3)	65(26.0)	0
10	Activity changes	63 (25.1)	100(40.2)	0
11	Appetite disturbances	57 (22.8)	127(50.7)	0
12	H/O Smoke in family	156 (62.5)	135(53.9)	0.656 (NS)*
Sr No.	Complications	Group A n=219(%)	Group B n=222(%)	p-value
1.	Pharyngitis	76 (34.70)	150(68.49)	0
2	Tonsillitis	13(5.94)	48(21.91)	0
3	Otitis media	10(4.52)	78(35.62)	0
3a	Secretory OM	06(2.74)	27(12.33)	0
3b	Suppurative OM	03(1.37)	41(18.72)	0
3c	Perforated TM	01(0.46)	10(4.52)	0.005
4	Sinusitis	04(1.83)	11(5.02)	0.065 (NS)
5	Acute LRTI	14(6.39)	13(5.94)	0.842 (NS)4

*Not significant

The total number of complications were higher in children with persistent rhinorrhoea as compared to children with acute rhinorrhoea (Table). The pattern of complications was observed to be same even during follow up examinations. 4(1.8%) patients in group A and 22 (9.1%) patients in group B had abnormal tympanogram on 30th day ($p < 0.001$).

Discussion

The subset of patients of rhinorrhoea with prolonged symptoms may be a group who probably develops bacterial super-infection and are at a greater risk to develop frequent and severe complications [3,4]. There are also problems related to liberal use of antibiotics in children with acute respiratory infections like emergence of antimicrobial resistance which is directly proportional to the extent of antibiotic use in the community [5]. Therefore, it is essential to carefully weigh the benefits from the antibiotic usage against the problems associated with widespread antibiotic misuse.

The purulent nasal discharge may be because of probable bacterial super-infection in patients with persistent rhinorrhoea. The association of pharyngitis and tonsillitis could be because of blocked nose, due to which a child breathes through mouth and develops a sore throat [6].

The otitis media with effusion (OME) in URTI is due to hypo-function of the Eustachian tube, leading to collection of fluid which contains bacteria and polymorphonuclear leukocytes, in the middle ear thus contributing to OME [7,8,9] The rate of OME (35.6%) in our study was higher than the study reported by Wald, Guerra NK, and Byers [10] where (29.2%) ARI were complicated by OME. The higher rate in our study could be because of greater risk of overcrowding, poor living conditions and personal hygiene, malnutrition and higher rate of bacterial carriage

In the present study 5.0% patients had sinusitis which was in comparison with other studies who have reported acute sinusitis as a complication of common cold in 0.5 to 5% of patients [10,12]. The presence of acute sinusitis may be because of mucosal inflammation which may lead to obstruction of the sinus cavities. Without proper drainage

bacteria that are part of the normal upper respiratory tract flora can be trapped and proliferate and results into acute sinusitis [13]

The overall complication rate 28.8% was higher in patients with persistent rhinorrhoea as compared to 15% reported by Wald ER [14]. The complication rate in group B was observed to be higher than the group A on follow up examination, probably because of chronic rhinosinusitis in group B.

Tympanometry was done to find out impedance deafness. The persistence of secretion in the middle ear cavity following the allergic rhinitis may compromise the normal function of the ossicular chain and thus the transmission of sounds, leading to the onset of hypoacusis which may interfere negatively with child's mental and physical development [15]. Limitations of this study include difficulty in assessment of clinical signs like sinusitis in younger children and inability of isolation of viruses and culturing individual organisms.

Conclusion

Physicians caring for children see rhinorrhoea in everyday practice, and this clinical entity currently has multiple recommendations regarding management. This study demonstrated that the children with persistent rhinorrhoea constitute a risk group hence it is important to be able to distinguish this group of children. The complications in high risk group may be responsible for school absenteeism and poor scholastic performance³. Impedance deafness seems to be unfavorable for child's development hence adequate attention should be paid to the duration of symptoms and occurrence of complications and efforts should be made to minimize these.

After better elucidation of the complication rate in children with persistent rhinorrhoea along with reasonable theoretical and clinical evidence, antibiotic intervention for persistent rhinorrhoea may be effective in improving clinical out comes resulting in overall improvement of child health worldwide.

Further, long term controlled trials spread over multicenters are suggested.

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