



PREVALENCE OF CONJUNCTIVITIS AMONG THE CHILDREN IN SELECTED URBAN COMMUNITY: A CROSS SECTIONAL STUDY

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Abstract:

Introduction & Background: Conjunctivitis is an inflammation of the conjunctiva of the eye. The conjunctiva is the membrane that lines the inside of the eyelids and covers the eye. ¹**Aim:** To assess the prevalence of conjunctivitis amongst children aged 1–18 years. **Objective:** To describe demographic study sample; to describe conjunctivitis symptoms according to three sections of age group; to find out the correlation between selected demographic variables with symptoms of conjunctivitis. **Method:** Quantitative approach descriptive cross-sectional research design. **Participants/ Setting:** Children of age group 1–18 years, having symptoms of conjunctivitis were identified by systematic random sampling technique from selected Urban community of Pune city. A survey proforma including demographic profile and observational checklist was used to gather data pertaining to conjunctivitis and Intensity of symptoms among the study subjects. **Result:** Data were gathered using a structured questionnaire as demographic variables and observational checklist on signs & symptoms of conjunctivitis. The result demonstrated sticky eyelids and dry eyes were the most common symptoms reported by all the subjects, and redness being the second most common. The p-value for mucoid discharge and watery discharge ($p=0.052$), is just slightly above this threshold, so it is marginally significant. There is a weak, negative correlation ($r = -0.108$) between the age of the child with watery discharge and the presence of mucoid discharge with monthly family income. **Conclusion:** Conjunctivitis is an endemic ocular disease among children in the urban community of Pune city. Therefore to reduce the burden associated with this condition public health measures including good hygiene and timely intervention with safer drugs and effective health education related to behavior modification among parents and children to be required.

Keywords: Conjunctivitis, Prevalence, Children, Urban community

Introduction:

Conjunctivitis is a common problem among pediatrics. It is divided into infectious and non-infectious etiologies. There are several ways to categorize conjunctivitis; it may be classified based on etiology, chronicity, severity, and extent of involvement of surrounding tissue.¹⁰ The most common causes of childhood conjunctivitis are:

- Bacteria
- Viruses, including the herpes virus.
- Allergies

Bacterial conjunctivitis makes up most cases in children and often presents with purulent discharge and matting of the eyelids. Supportive treatment with an individual approach to antibiotic use in uncomplicated cases. Viral conjunctivitis is the other infectious cause and is primarily caused by adenovirus, with a burning, and watery discharge manage with supportive treatment. The main cause for Allergic conjunctivitis is seasonal with present of symptoms like bilateral itching and watery discharge. Treatment can include topical lubricants, topical antihistamine agents, or systemic antihistamines. Other causes of conjunctivitis include foreign bodies and non-allergic environmental causes. Neonatal conjunctivitis requires special care with unique pathogens and considerations.⁶

Conjunctivitis is also known as “pink eye” as the eye looks pink or red. In children, the condition is grouped into two, either newborn conjunctivitis or childhood conjunctivitis with different causes and treatments for each group. Childhood conjunctivitis is a very common problem in children with swelling of the conjunctiva. Large outbreaks of conjunctivitis are often seen in daycare settings or schools. The condition is caused by an infection that can spread from one eye to the other by touching the affected eye or fluid from the eye. Fluid from the eye is still contagious for 24 to 48 hours after starting treatment. Large outbreaks of conjunctivitis are often seen in daycare settings or schools.

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The common signs of conjunctivitis are redness, swelling, watery eyes and itching in the eyes. In infectious conjunctivitis there is a swelling of the conjunctiva or the thin layer in the eyes; there is an increase in tear production, there is fluid discharge from the eyes, and one has crusts in the eyes, especially in the morning.¹ Several cases of conjunctivitis are being reported daily in the national capital region including reported cases of conjunctivitis per day was 100 cases. There is usually a seasonal increase in conjunctivitis cases, which coincides with the flu season.⁹

Ving Fai Chan , Ai Chee Yong, Augusto Azuara-Blanco, et. all discussed a Systematic Review of Clinical Practice Guidelines (CPGs) for Infectious and Non-infectious Conjunctivitis. Clinical Practice Guidelines published between the year 2010 and March 2020 on non-infectious and infectious conjunctivitis experts were reviewed, evaluated, and selected using 9 items from the appraisal of guidelines for research and evaluation II tool (4, 7, 8, 10, 12, 13, 15, 22 and 23). CPGs with an average score for items 4, 7, 8, 12, or 22 below 3 and a sum of the two researchers’ average score for all 9 items less than 45 were excluded. The study concludes that there are several high-quality CPGs for non-infectious and infectious conjunctivitis. While there were several consistencies in the recommendations provided

within these CPGs, several inconsistencies were also identified. Many of which related to the scope of practice of the targeted end-user of the guideline.¹⁰

Review of Literature:

Evans Gyimah Boateng, and Emmanuel Awuah conducted study on Prevalence of allergic conjunctivitis among basic school children in the Kumasi Metropolis (Ghana): a community-based cross-sectional hospital-based study on the prevalence of allergic conjunctivitis compared with community-based ones, among children. The study aimed to determine the prevalence of AC among basic school children in the Kumasi Metropolis, while identifying its associated symptoms. The study includes 1571 students from 11 basic schools (Primary and JHS) participated in the study. Data collected in the month of November 2011- March 2014. Followed by history taking, subjects underwent a battery of tests; visual acuity, objective refraction, anterior and posterior segments examination with a slit-lamp and a direct ophthalmoscope respectively. The prevalence of AC was 39.9 %. The mean (\pm SD) age of participants was 8 ± 0.65 years. AC was significantly associated with gender ($p < 0.05$), but not with age ($p > 0.05$). A total of 70 % of the students with AC never had any form of treatment.²

Nabaz Faisal Shakir Aga Diyala conducted a study to compare the prevalence of allergic and infective conjunctivitis among school children in the rural & urban regions of Erbil Governorate. The total numbers of urban and rural school children in this study were 1129 and 1093 respectively. The prevalence of infective conjunctivitis in both urban & rural children was as such: 127(11.2%) & 211(19.3%). The rates of positive culture in both were: urban 69, 54.3%; rural 143, 67.8% ($p \leq 0.01$). Staphylococcus aureus was the most common pathogen isolated, urban: 37(53.6%) rural: 79 (55.2%). Infective conjunctivitis was distributed significantly in young ages and in male students ($p \leq 0.05$). Regarding allergic conjunctivitis: the prevalence of allergic conjunctivitis was in urban 247(21.9%), rural 81(7.4%). Allergic conjunctivitis was more distributed in older ages and male children, but this was not significant. Itching was complained by all students. Infectious conjunctivitis among rural school children is a major public health problem with a higher percentage of allergic conjunctivitis among urban school children was noted.³

David Ben Kumah, Seth Yaw Lartey, Felix Yemanyi, Evans Gyimah Boateng, and Emmanuel Awuah (2015) carried out a community-based cross-sectional investigation on the prevalence of allergic conjunctivitis among elementary school students in the Kumasi Metropolis (Ghana). It seems a preponderance of hospital-based studies on the prevalence of allergic conjunctivitis compared to community-based ones. The body of research indicates that there may be an underdiagnosis of AC in the hospital context, which is more likely to occur in men who often exhibit insufficient hospital-attending behaviors. This could cause the actual cost of AC to be underestimated. The goal of the community-based study was to ascertain the prevalence of AC and the symptoms that are linked to it in elementary school students in the Kumasi Metropolis. The prevalence of AC was 39.9 %. The mean (\pm SD) age of participants was 8 ± 0.65 years. AC was significantly associated with gender ($p < 0.05$), but not with age ($p > 0.05$). A total of 70 % of the students with AC never had any form of treatment.²

Tetsuaya Muto, Shinichiro Imaizumi, Koju Kamo (2023), article about viral conjunctivitis that was discussed. Eighty percent of instances of acute conjunctivitis are caused by viruses, with enterovirus and herpes virus being the most prevalent culprits. Viral conjunctivitis typically spreads quickly. Therefore, it is essential to sterilize surfaces, carefully enforce hand washing rules, and diagnose infections as soon as possible to stop the spread. Adenoviruses are responsible for about 80% of viral conjunctivitis cases. It might spark a pandemic and become a major worldwide problem. The diagnosis of herpes simplex viral conjunctivitis is critical for administering corticosteroid eye solution as a treatment for adenovirus conjunctivitis. Although specific treatments are not always available, catching viral conjunctivitis early on can help to minimize symptoms in the short term and prevent problems down the road.⁵

Yasutsugu Akasaki , Takenori Inomata , Jaemyoung Sung , et all 2022 The purpose of the study was to ascertain the prevalence of allergic conjunctivitis (AC) and dry eye (DE). The one-group meta-analysis was used in a random-effects model to integrate the study-specific estimates of the incidence rates of DE and AC among patients with AC and DE, respectively. The qualitative synthesis contained five articles that reported the incidence of AC among people with DE and six publications that reported the incidence of DE among people with AC. There were 7254 patients in all among the nine publications. Those with AC had a DE incidence of 0.9-97.5%, while those with DE had an AC incidence of 6.2-38.0%. Using a random-effects model, a one-group meta-analysis revealed that 17.8% (95% confidence interval: 0.120-0.236; 793/4855 cases) of patients with AC and 47.2% (95% confidence interval: 0.165-0.779; 320/1932 cases) of patients with AC had comorbid DE.⁸

Hypothesis:

1. There is a significant correlation between selected demographic variables with symptoms of conjunctivitis.

Research Methodology:

A descriptive cross-sectional survey design was chosen for the present study, which involved collecting data from research subjects to accomplish the objectives of the study. Convenience sampling techniques were used to collect data. Data collection took place in the month of July 2023-August 2023 in a selected area of the urban community that falls under the Municipal Corporation. The sample comprised children aged 1-18 years of age which was grouped as 1-6years of age, 7-12 years of age & 13-18years of age.

Tools and Techniques:

A tool was developed by conducting a review of textbooks and literature. The tool was validated. The demographic data collected includes children's age, gender, religion, Type of family, educational status of Parents, Monthly family Income, have you experienced episodes of conjunctivitis in family and children, Treatment taken in hospital /home care. The observational checklist contains 09 symptoms for assessing prevalence of conjunctivitis.

Analysis:

Descriptive and inferential statistics were used to analyze the data. The findings were then organized and presented as demographic data, an observational checklist that focused on prevalence of conjunctivitis among children.

Analysis of Socio-Demographic Variables:

The analysis deals with socio-demographic variables, which were analyzed using frequency and percentage.

Table 1. Frequency & Percentage Distribution of Demographic Characteristics**N=325**

Demographic characteristics		f	%
Age of child in years	1-6 years	103	31.7
	7-12 years	130	40
	13-18 years	92	28.3
Gender	Male	160	49.2
	Female	165	50.8
	Other	0	0
Religion	Hindu	227	69.8
	Muslim	78	24
	Christian	20	6.2
	Other	0	0
Type of family	Nuclear	184	56.6
	Joint	141	43.4
	Extended	0	0
Educational status of Parents	Illiterate	20	6.2
	Up to Higher Secondary	257	79.1
	Graduation	48	14.8
	Postgraduation	0	0
Monthly family Income	below 10,000/-	139	42.8
	Rs.10,001-20,000/-	142	43.7
	Rs.20,001-30,000/-	30	9.2
	above 30,001/-	14	4.3
Have you experience episode of conjunctivitis in family and children	Yes	195	60
	No	130	40
Treatment taken in hospital /home care.	Hospital	125	38.5
	Home	70	21.5
	No care	130	40

Analysis of symptoms of conjunctivitis:

Table 2. below shows symptoms of conjunctivitis across the different age groups for instance age group between 1-6years of age, 7-12years of age, & 13-18years of age.

Table 2. Distribution of symptoms of conjunctivitis among children.

N=325

Symptoms of Conjunctivitis	Age groups					
	1-6 years		7-12 years		13-18 years	
	Yes	No	Yes	No	Yes	No
Itching eyes	84	19	106	24	73	19
Redness	81	22	91	39	72	20
Pain in the eye	85	18	98	32	70	22
Watery discharge	80	23	102	28	69	23
Sticky eyelids	92	11	114	16	84	8
Headache	91	12	106	24	75	17
Mucoid discharge	83	20	121	9	82	10
Puffy eye	88	15	110	20	84	8
Dry eyes	97	6	122	8	85	7

Fig 1. Shows distribution of symptoms of conjunctivitis among children.

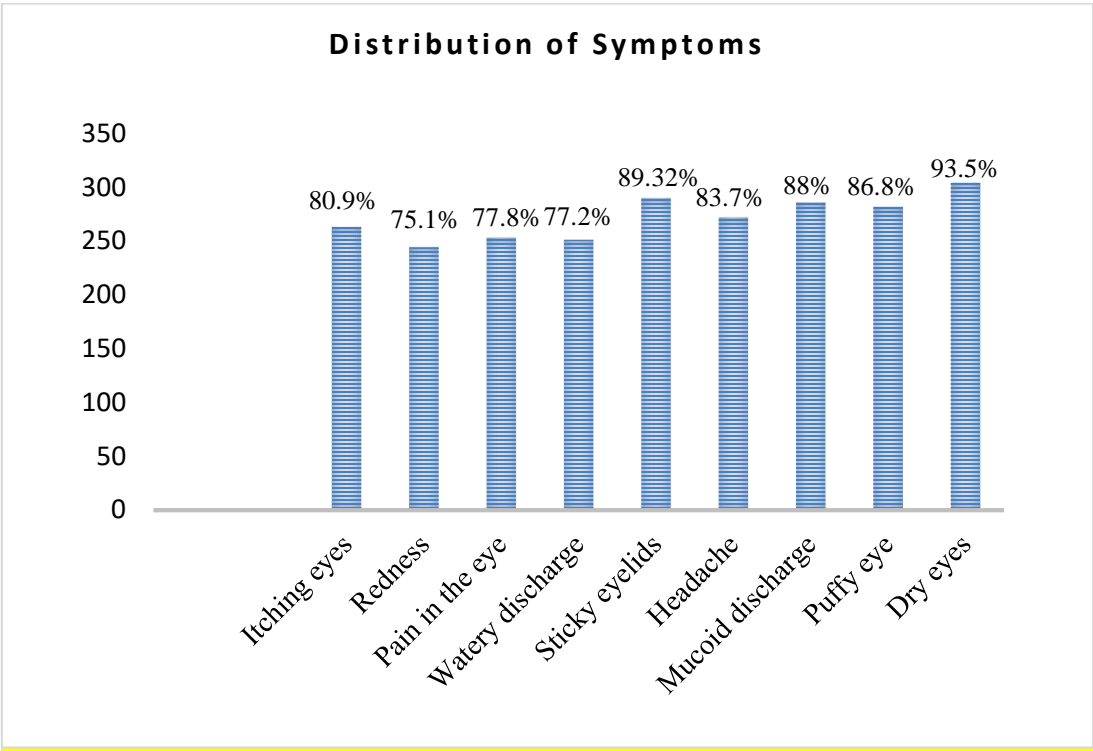


Table.3 Nonparametric Spearman's rho Correlations:

Demographi c variables		Itchi ng eyes	Rednes s	Pain in the eye	Watery dischar ge	Sticky eye lids	Head ache	Mucoid discharg e	Puff y eye	Dry eyes
Age of child in years	Correlation Coefficient	.021	.008	.062	.023	-.023	.074	-.108	-.064	.027
	P value	.706	.882	.263	.675	.684	.184	.052	.248	.621
Religion	Correlation Coefficient	- .010	.051	.007	.076	.035	.043	.060	.009	.091
	P value	.856	.359	.899	.172	.535	.435	.284	.877	.103
Gender	Correlation Coefficient	.102	.055	-.053	-.096	.064	.068	.023	.021	-.017
	P value	.066	.322	.344	.083	.249	.220	.683	.703	.766
Type of family	Correlation Coefficient	- .030	.041	-.018	-.031	.016	.000	.021	-.030	.022
	P value	.590	.461	.740	.576	.769	.999	.711	.586	.687
Education	Correlation Coefficient	- .042	-.031	-.023	-.009	-.001	.043	-.003	-.014	.033
	P value	.453	.581	.684	.876	.990	.445	.962	.801	.548

Monthly family income	Correlation Coefficient	- .077	-.048	-.078	-.108	.000	.008	.036	-.100	.022
	P value	.169	.390	.160	.052	.994	.886	.517	.073	.688
Treatment taken in hospital /home care	Correlation Coefficient	- .346 **	-.421**	-.395**	-.457**	-.275**	- .291**	-.285**	- .295* *	- .147* *
	P value	.000	.000	.000	.000	.000	.000	.000	.000	.008

Discussion:

The current study sought to find out the prevalence of conjunctivitis among children of age group 1–18 years.

The analysis deals with socio-demographic variables, which were analyzed using frequency and percentage. A total of 325 children were surveyed during this period, out of which 160 (49.2%) were males and 165 (50.8%) were females. The majority (40 %) of children were between 7 and 12 years, (31.7%) were between 1 and 6 years, and 28.3 % were between 13 and 18 years old. Additionally, 69.8% of the samples were from the Hindu religion, 24% samples were from Muslim, 6.2% of the samples were from the Christian religion. Regarding education of parents, nearly 20% of parents were illiterate, 79.1% had a up to higher secondary education. Most families (86.2%) had a monthly income of below Rs.20,000. 195 (60%) family and children experienced episode of conjunctivitis. Additionally, 38.5% families taken treatment at hospital and 21.5% at home. (Table 1)

Analysis of symptoms of conjunctivitis deals with distribution of symptoms of conjunctivitis across the different age groups for instance age group between 1-6years of age, 7-12years of age, & 13-18years of age. In our study, sticky eyelids and dry eyes were the most common symptoms reported by all the subjects, and redness being the second most common. Among the children with conjunctivitis, mucoid discharge being the second most common symptom. (Fig 1).

The correlation between the symptom "Mucoid Discharge" and the age of children in a sample of 325 cases. The correlation coefficient is -0.108, and the p-value is 0.052. In this case, the correlation coefficient is -0.108, which is negative. A negative correlation indicates that, as one variable (age of the child) increases, the other variable (Mucoid Discharge) tends to decrease, and vice versa. However, the magnitude of -0.108 suggests a relatively weak negative correlation. The p-value is 0.052, is just slightly above this threshold, so it is marginally significant. There is a weak, negative correlation ($r = -0.108$) between the age of the child and the presence of mucoid discharge.

The correlation between the symptom "Watery Discharge" and the monthly family income in a sample of 325 cases. The correlation coefficient is -0.108, and the p-value is 0.052. In this case, the correlation coefficient is -0.108, which is negative. A negative correlation indicates that, as one variable (monthly family income) increases, the other variable (watery discharge) tends to decrease, and vice versa. However, the magnitude of -0.108 suggests a relatively weak negative correlation. The p-value is 0.052, is just slightly above this threshold, so it is marginally significant.

There is a weak, negative correlation ($r = -0.108$) between the monthly family income and the presence of watery discharge.

The Spearman correlation coefficients and their associated p-values for various symptoms (Itching eyes, Redness, Pain in the eye, Sticky eyelids, Headache, Puffy eye, Dry eyes) with a demographic variables and treatment taken in hospital/home care. For each of these symptoms, there is a strong negative correlation with the demographic variable & treatment taken in hospital/home care. The p-values (all equal to 0.000) are highly significant, indicating a robust relationship. This suggests that as the choice of treatment (hospital care or home care) shifts, the prevalence or severity of these symptoms tends to change. Dry eyes show a moderate negative correlation with the choice of treatment. The p-value (0.008) is significant, though it is less significant compared to the other symptoms. These results may have clinical and practical implications for the management of eye conditions in different settings.

Sharmistha Behera, Jayashree Dora, Durga Sahu, Madhumita Naik (2021) conducted study on prevalence of Allergic Conjunctivitis (AC) and Associated Comorbidities among School Going Children in Western Odisha - A cross sectional observational study with total of 1502 children from 10 schools of Burla, participated in this study. The prevalence of allergic conjunctivitis was found to be 29.16 % with a male to female ratio of 1.02: 1. The Children aged in between 13 – 16 years recorded the highest number 43.60 % of cases. The commonest presenting symptom was itching (100 %), Papillae were the most frequent sign (97.71 %), Seasonal allergic conjunctivitis (SAC) was the most common type of AC reported (59.36 %), and allergic rhinitis (17.8 %) was the most common associated comorbidity.

Conclusion:

Conjunctivitis is an endemic ocular disease among children. The prevalence of conjunctivitis is high among school going children, but they are under-diagnosed because of a lack of treatment-seeking behavior. To reduce the burden associated with this condition public health measures may be required. There is no specific treatment for conjunctivitis, good hygiene and timely intervention with safer drugs and effective health education related to behavior modification among parents and children which plays a major role in minimizing risk of spread of infection and complications related to conjunctivitis.

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