

FACTORS LEADING TO THE PREVALENCE OF VIRAL CONJUNCTIVITIS AMONG PATIENTS RECEIVING EYE CARE SERVICES AT JINJA REGIONAL REFERRAL HOSPITAL.

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ABSTRACT

Purpose of the study

To determine the factors leading to the prevalence of viral conjunctivitis among patients receiving eye care services at Jinja Regional Referral Hospital.

Study methods

The study used a descriptive cross-sectional design applying qualitative and quantitative methods to analyze data.

Principle findings

From a total of 100 respondents that were randomly selected, the study established that viral conjunctivitis was more prevalent in the age group of 25-40 years 50%(50), more in females 52%(52) than males 48%(48) and also had chances of recurrence twice 51%(20). Viral conjunctivitis was associated with URTI 29% (29), more in urban places 71% (71), and was also associated with systemic conditions mostly in DM 20% (20). The management strategies ranged from the use of eye drops and ointments 56% (56) to self-limiting with no use of eye drops 44% (44) and among those who used eye drops and ointments the most used was acyclovir ointment 39% (22).

Conclusion

The study established that viral conjunctivitis was more prevalent in people aged 25-40 years and more in females. Risk factors were sought to be URTI and systemic conditions like DM where management strategies ranged from the use of treatment to self-limiting with no use of treatment.

Recommendation

There should be massive sensitization by the government to increase people's awareness of the risk factors for acquiring viral conjunctivitis—isolation of people from endemic places to prevent the rapid spread because viral conjunctivitis is too contagious. And finally, the government should establish more specialized hospitals (eye clinics) to increase accessibility to eye care services.

Keywords: *Viral Conjunctivitis, Eye Care Services, Jinja Regional Referral Hospital*

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Background of the study

Viral conjunctivitis is an inflammation of the conjunctiva caused by a virus. It is a highly contagious eye infection that causes inflammation of the eye's outer surface. Conjunctivitis is one of the most common ophthalmic presentations to the emergency department (ED) both in Australia and the Globe and urgent attention is needed to intervene in this condition as fast as possible. It affects patients across all age groups and of any socioeconomic class. Viral conjunctivitis is the most common cause of infectious conjunctivitis, accounting for 60-70% of cases. It also has a considerable economic and societal impact due to a range of factors.(Marinos et al., 2019a) These include the direct costs of general practitioner and emergency department visits, the costs of diagnostic tests and prescription treatments, and indirect costs associated with loss of work or time away from school or university(Marinos et al., 2019b).

There have been very few epidemiology studies on patterns of viral conjunctivitis in Australia in the past 30 years. To date, no sex predilection for viral conjunctivitis has been found. However, some subtypes of adenoviral

conjunctivitis are more common in younger age groups(Marinos et al., 2019c). Weather also appears to affect the incidence of adenoviral conjunctivitis, with outbreaks in Australia, China, and the United States tend to occur more frequently in the summer months. While contact lens wear is known to be single the largest risk factor for microbial keratitis, there is no current evidence to suggest that contact lens wear is an independent risk factor for developing viral conjunctivitis. Treatment of viral conjunctivitis is based on clinical and laboratory findings. However, clinical diagnosis of adenoviral conjunctivitis has shown to be unreliable particularly in primary care settings, with an inaccuracy rate of 50% when compared with laboratory-confirmed diagnoses. Additionally, it has been difficult to clinically differentiate between follicular conjunctivitis caused by adenovirus, herpes simplex virus (HSV), varicella-zoster virus (VZV), chlamydia trachomatis, ocular surface medicaments, and ocular rosacea. Correct and early identification of etiology allows appropriate treatment and the avoidance of longer-term complications(Solano et al., 2024). One of the most significant costs for viral

conjunctivitis arises from the prescription of antibiotics. In the Netherlands, around US 10.9 million dollars was spent in a single year on topical antibiotic eye drops, while the British National Health System spends around US \$8.7 million per year. In the United Kingdom, rates of antibiotic treatment for patients with infectious conjunctivitis by general practitioners are estimated to be between 80% and 95%. In the United States, improved diagnostic rates of viral conjunctivitis were estimated to reduce the number of inappropriate antibiotic prescriptions by over 1 million and provide savings of US \$430 million per year. Similar rates of antibiotic prescription are seen across other developed countries. Currently, specific treatment for viral conjunctivitis is being evaluated in clinical trials and once available will likely impact antibiotic use.

The study aims to analyze recent trends in epidemiology, clinical signs and symptoms, PCR results, and treatment strategies for viral conjunctivitis patients. Through this analysis, the study will identify any predisposing factors and any correlations between clinical signs, viral etiology, and treatment strategies. To determine the factors leading to the prevalence of viral conjunctivitis among patients receiving eye care services at Jinja Regional Referral Hospital.

Specific objectives

- To identify the prevalence of viral conjunctivitis among patients receiving eye care services at Jinja Regional Referral Hospital.
- To find out the associated risk factors to the common etiologies of viral conjunctivitis among patients receiving eye care services at Jinja Regional Referral Hospital.
- To identify the management strategies for viral conjunctivitis among patients receiving eye care services at Jinja Regional Referral Hospital.

METHODOLOGY

Study design

The study used a descriptive cross-sectional study design applying both qualitative and quantitative methods to assess the factors leading to the prevalence of viral conjunctivitis among patients receiving health care in Jinja Regional Referral Hospital.

Study area

The study area was the outpatient department (eye clinic) of Jinja Regional Referral Hospital. The hospital is located in the southeastern region of the country Jinja central division, Jinja city near the source of the Nile. It was founded in 1962. The hospital serves several patients across the region where some are referred from other hospitals and health Centre IVs while others are self-referred. Among the services provided include eye care services, surgical operations, orthopedic services, private care, gynecology, pediatric, dental, lab, X-ray, HIV testing, counseling, reproductive health services, and safe male circumcision.

This study was carried out from September 2022 up to May 2023.

Study population

The study population comprised all viral conjunctivitis patients receiving eye care services at the Jinja Regional Referral Hospital at the eye clinic.

Sample size determination

The sample size was determined using Cochran's formula (1977).

Sample size, $n = (z^2 pq) / d^2$

Where n = sample size,

z = Number of people interviewed per day.

p = is the proportion of respondents with viral conjunctivitis (target population groups).

Since p is not known with certainty, we therefore estimate it at $7\% = 0.07$, which is the maximum value.

$q = 1 - p$ ($1 - 0.07$) $= 0.93$ (The probability of selecting respondents without viral conjunctivitis).

$d = 0.05$, the maximum error

$n = (1.96 \times 1.96 \times 0.07 \times 0.93) / (0.05 \times 0.05) = 100.3$ respondents

Therefore, 100 respondents will be considered for this study.

Sampling procedure.

A purposeful sampling technique was used to select the respondents where only respondents with viral conjunctivitis as well as caretakers of all children with viral conjunctivitis were selected among patients receiving eye care services at Jinja Regional Referral Hospital.

Sampling technique

A random sampling process was used since a specific group of patients with viral conjunctivitis was required among patients receiving health services at Jinja Regional Referral Hospital.

Inclusion criteria

All patients and caretakers of children with signs and symptoms of viral conjunctivitis receiving eye care services at Jinja Regional Referral Hospital, who consented to take part in the study, were included.

Data collection method

The researcher used qualitative surveys and documents to collect data.

Data collection tool(s)

Data was collected using researcher-administered questionnaires.

Data collection procedure

The principal investigator started by creating rapport with the respondents and reassuring them about confidentiality by having assigned unique numbers known by only the researcher. The questions were read clearly and interpreted for the respondents to understand. Responses were given in local languages and written in English by

the principal investigator. At the end of the interview, the respondents were thanked for their cooperation.

Data quality control

This was done by reviewing the data of other senior ophthalmologists to improve the authenticity of the data collected.

Pre-visiting

The researcher visited Jinja Regional Referral Hospital before the study got permission from the hospital director and in-charge of the eye department and also ascertained that the study was relevant and there was a need for the study to be carried out in this specific study area.

Pre-testing

Questionnaires were pre-tested for completeness and reliability on four patients in the Jinja Regional Referral Hospital eye clinic.

Data process, analysis, and presentation

After collecting data, it was processed with both qualitative and quantitative by tallying and will be presented by narration, use of tables, bar graphs, and pie charts. Qualitative data was processed and analyzed numerically.

Ethical consideration

Introductory letter

Upon approval of the research proposal by the school, a letter of introduction was provided by the school administrator and then it was delivered to the hospital director of Jinja Regional Referral Hospital who introduced the researcher to the in charge of the Jinja Regional Referral Hospital eye department.

Informed consent

Verbal consent, signatures, and thumbprints (for those who do not know how to write) were sought from the respondents after a thorough explanation of the topic. The respondents were assured of their rights to consent.

Confidentiality

Before data was collected, the researcher first assured the respondents that the information obtained from him/her was kept private and ensured confidentiality and would only be used for academic purposes and planning to promote better social life for patients.

RESULTS

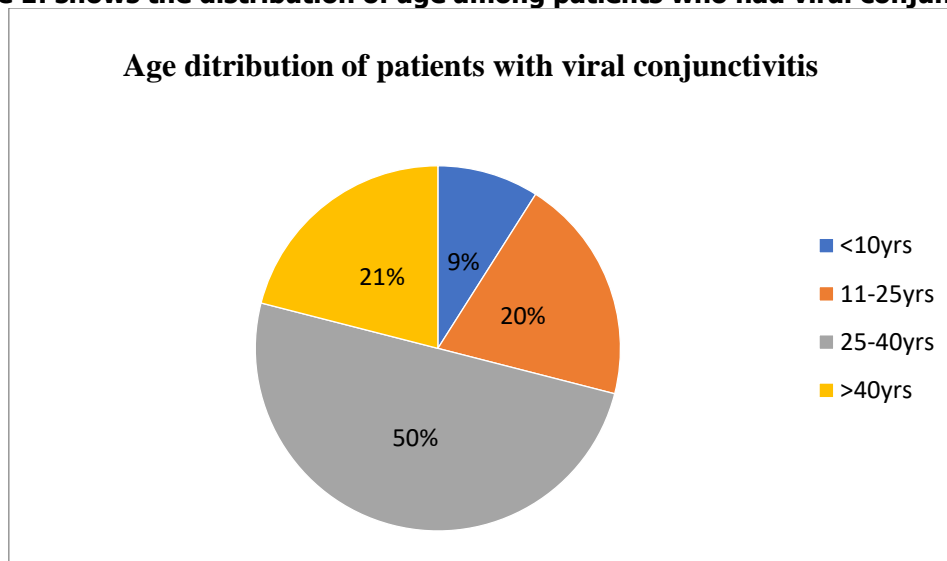
Prevalence of viral conjunctivitis among patients receiving eye care services in JRRH

The first objective was to determine the prevalence of viral conjunctivitis among patients receiving eye care services in JRRH and the principle investigator used demographic data and other questions to determine the prevalence of viral conjunctivitis.

Table 1: Shows the distribution of socio-demographic data about patients who had viral conjunctivitis

Variable	Frequency	Percentage (%)
Age(yrs.)		
<10	09	9
10-25	20	20
25-40	50	50
>40	21	21
Sex		
Female	52	52
Male	48	48
Address		
Urban	71	71
Rural	29	29
Education level		
None	34	34
Primary	30	30
Secondary	20	20
Tertiary/university	16	16
Occupation		
Farmers	28	28
Private Employees	21	21
Civil servants	11	11
Students	24	24
None	16	16

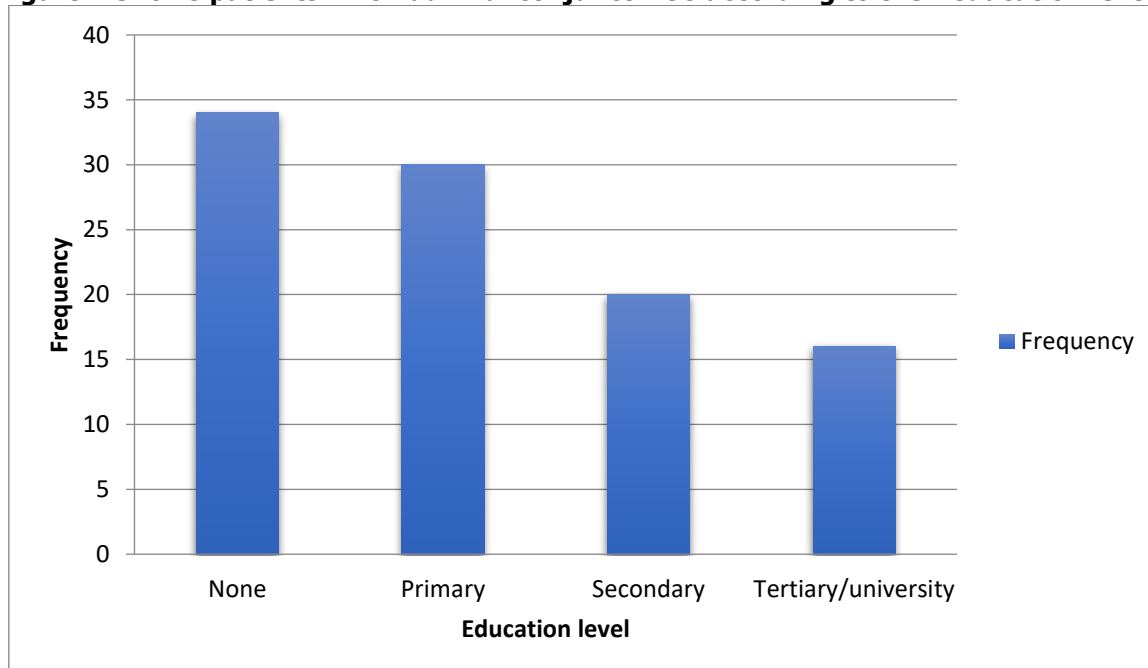
Figure 1: shows the distribution of age among patients who had viral conjunctivitis



According to the demographic data of respondents on age, half 50% (50) of the respondents were between 25-40 years, 21% (21) were above 40 years, 20% (20) were between 10- 25 years, and the least being below 10 years

of 9% (09). On the address, the majority came from rural areas 71% (71) and the minority to have been from urban areas 29 % (29).

Figure 2 Shows patients who had viral conjunctivitis according to their education levels.



On the education level the majority were of none 34% (34), followed by those of primary level 30% (30), then secondary, and the list of tertiary institutions 16% (16) and above of the total respondents. On sex the majorities were

males by 64% (64) and the minorities were females by 36% (36)

On occupation status of the respondents, most of them were farmers 28% (28), followed by students 24% (24) and the minority being civil servants 11% (11)

Factors for the prevalence of viral conjunctivitis

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Table 2 shows factors for the prevalence of viral conjunctivitis

Response	Frequency	Percentage (%)
Have you suffered from the same condition before		
Agree	39	39
disagree	61	61
How many times individual suffered from the same condition		
2	20	51
3	10	26
4	07	18
Others	02	5
When asked about the history of URTI		
agree	28	28
disagree	72	72

With regards to the prevalence of viral conjunctivitis when respondents were asked whether they have ever suffered from a similar condition, most of them disagreed 61% (n=16) and the least number agreed of 39% (n=39). When they were asked how many times they agreed the majority of the respondents had suffered only twice 51% (n=20) and the minority had suffered from the condition more than four times 5% (n=02)

When asked about the history of URTI, the majority of the respondents disagreed 72% (n=72) and the minority of them agreed 28% (n=28)

Risk factors to the etiology of viral conjunctivitis.

The second objective was to find out the risk factors associated with the causes of viral conjunctivitis and the principal investigator used questionnaires to find these factors

Table 3 shows risk factors for the aetiologies of viral conjunctivitis

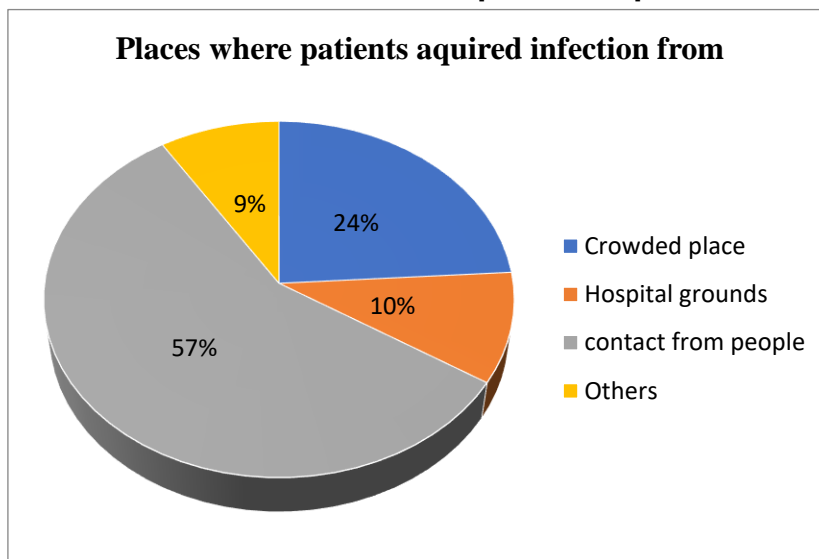
Response	Frequency (n=100)	Percentage (%)
Place of residence		
Urban	71	71
Rural	29	29
A place where patients get the infection		
Crowded place	24	24
Hospital grounds	10	10
Contact from friends	57	57
Others	09	9
Associated diseases		
HIV/AIDs	18	18
TB	04	4
DM	20	20
NONE	58	58
When asked whether have been to endemic places of viral conjunctivitis		
Agree	44	44
Disagree	36	36
Don't know	20	20

According to risk factors associated with the etiology of viral conjunctivitis, when patients were asked where they

reside, the majority of the respondents were residing in urban areas 71% (71) where there is a lot of congestion

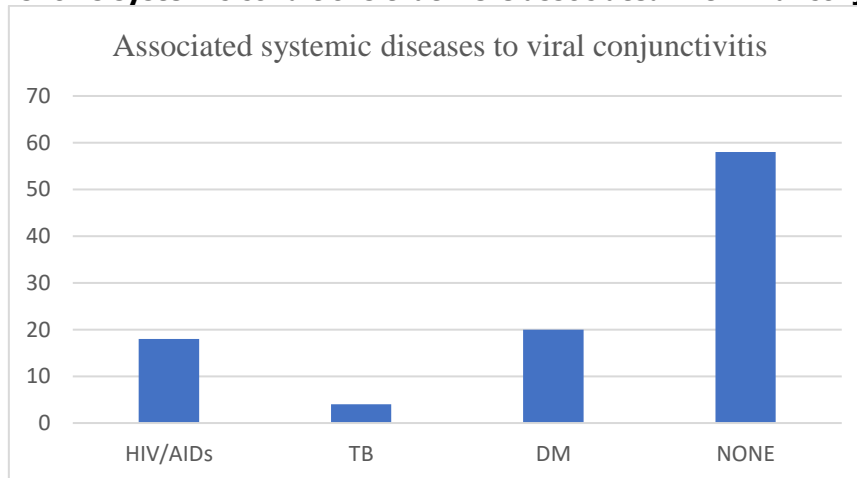
people and the minority have been residing in rural areas by 29% (29) where congestion is less.

Figure 3 shows different locations where patients acquired viral conjunctivitis



Considering places where patients thought to have gotten the infection, the majority of the respondents seemed to have gotten the infection from contact with other people 57% (57) and the minority to have gotten it from the hospital 10% (10).

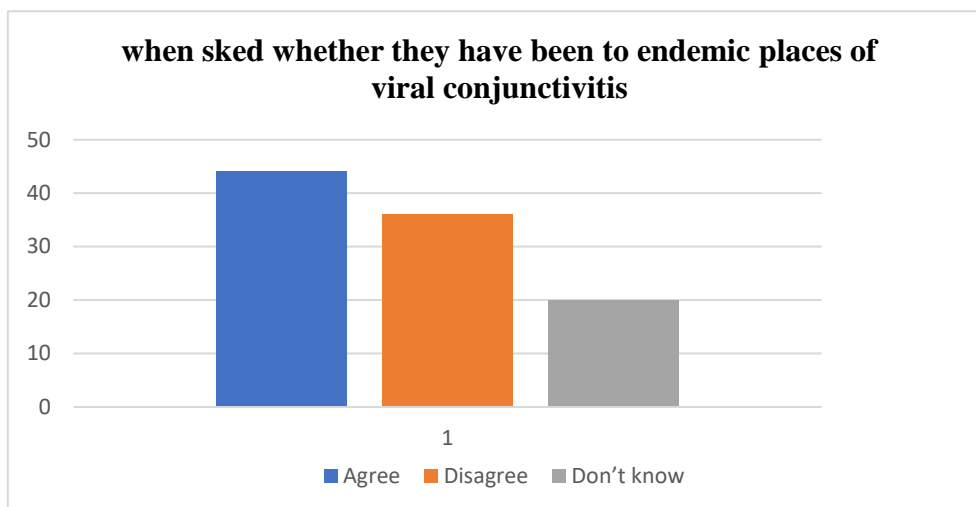
Figure 4: shows systemic conditions that were associated with viral conjunctivitis



When respondents were asked about the associated systemic conditions, the majority had no associated systemic infection 58% (58), though some had suffered

from diabetes mellitus 20% (20), and others had the association of HIV/AIDS 18% (18) and the minority to have suffered from TB 4% (04).

Figure 5 shows patients who had a history of being in endemic places



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When patients were asked whether have been to endemic places of viral conjunctivitis, the majority of the respondents agreed 44% (44), then 36% (36) of the respondents disagreed and the least number didn't know 20% (20)

Management strategies for viral conjunctivitis

The third objective was to identify the management strategies for viral conjunctivitis and the principal investigator used questionnaires to come up with data regarding the various management strategies from patients.

Table 4: Shows the management strategies for viral conjunctivitis

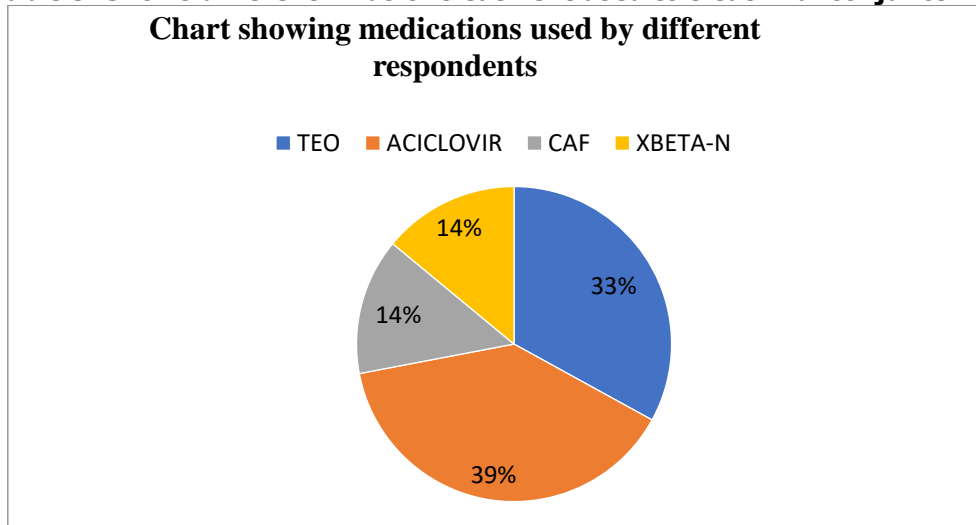
Variables	Frequency	Percentage (%)
Use any eye drops to treat your eye problem		
Yes	56	56
No	44	44
If yes any improvement		
Great	30	54
Mild	16	29
Less	10	17
If No improvement		
Great	30	68
Mild	09	21
Less	05	11

When respondents were asked about the use of eye drops or ointments, the majority of them agreed to have used them 56 % (56) and the rest disagreed upon using any treatment 44 % (44).
Of those who had used treatment, the majority of them realized a great improvement 59 % (33) others had a mild

improvement 23 % (13) and the others achieved a less improvement 18% (10).

Of those who had not used any treatment, the majority of them had improved greatly 68(30), others got a mild improvement 23 % (09) and the least realized a less improvement 11% (05)

Table 5: Shows different kinds of treatment used to treat viral conjunctivitis



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The most commonly used medication to treat viral conjunctivitis was acyclovir eye ointment 39% (22) and the least commonly used medication was CAF 14%(08) and XBeta-N 14 (08).

Discussion

According to the social demographic data of respondents on age, the majority of the respondents were aged between 25-40 years 50% (50). This is because this age group is an active age that engages in very many economic activities in crowded places putting them at risk of acquiring viral conjunctivitis, this is in line with the research carried out by Ingrid Scott, et al, 2023.

By sex, the cumulative number of cases reported among females 52%(52) was higher than that of males 48%(48) though the difference wasn't significant, these findings are in line with the study carried out in India by Madurapandian et al., 2022 about the outbreak of viral conjunctivitis among students and school staff of the visually impaired school.

According to education level, viral conjunctivitis was more prevalent in primary pupils, this is because most of these children are not sensitized about the preventive measures for example proper hand and face washing and avoiding always touching their eyes.

Prevalence of viral conjunctivitis

The study established that the majority of the respondents had no history of recurrence of viral conjunctivitis though we registered cases of recurrence of viral conjunctivitis. This could be due to the presence of underlying systemic conditions that prevent the body from fighting illness, especially immunocompromised patients.

According to the research findings, viral conjunctivitis was more prevalent in patients who had upper respiratory tract infection (URTI) 59 % (59) and less in those with no URTI 41 % (41). This is because viral conjunctivitis is most commonly caused by contagious viruses associated

with the common cold like adenovirus This study is in line with the study carried out by www.aoa. Org.

Risk factors for etiology of viral conjunctivitis

The study revealed that viral conjunctivitis was more common in people who were residing in urban places 71% (71) than those residing in rural areas 29%(29). This is because viral conjunctivitis is very contagious and can easily spread in crowded places which is the case in urban places.

The study also established that most of the cases of viral conjunctivitis were acquired from person to person by direct contact 57% (57) and the list from hospital grounds10%(10).

According to the study, the majority of the respondents had none of the systemic conditions 58 % (58), this is due to the above factors though the leading systemic condition was HIV 18 % (18), and the least was TB4 % (04) this is because of the decreased immunity caused by systemic conditions like HIV/Aids. This is in line with the study carried out in India by Amir et al, 2020.

The study also revealed that most of the respondents had come from endemic places 44% (44) Like schools communities and regions this is in line with the study carried out by Makumbi et al, 2010.

Management strategies for viral conjunctivitis

From the study, most of the respondents had used eye drops and ointments 56 % (56) to treat their eye problem, and a minority 44 % (44) had not used eye drops to treat their eye problem.

Among those who had eye drops and ointments to treat their eye problem, the majority 59 % (33) had a great improvement and the minority had a less improvement 18 % (10).

Among those who had not used any treatment, the majority also had a great improvement 68% (30) and the

minority had a less improvement 11% (05). This is because viral conjunctivitis is self-limiting in most cases though if it does improve anti-inflammatory eye drops and anti-viral eye ointments are used. This is in line with the study carried out in Uganda by Melvin et al, 2022 which showed that viral conjunctivitis is self-limiting for 1 week in mild cases up to 3 weeks in severe photophobia or whose vision is affected may benefit from topical steroids and topical anti-virus if prescribed by an ophthalmologist, but Herpes simplex keratitis must be ruled out first because steroids can exacerbate the condition.

The study also revealed that the most commonly used medication of those who used treatment to treat viral conjunctivitis was acyclovir eye ointment 39% (22) and the least commonly used medication was CAF 14% (08) and XBeta-N 14% (08). This is because due to symptoms anti-viral topical treatment is mostly prescribed by an ophthalmologist to embark on the symptoms of viral conjunctivitis and steroids are rarely prescribed due to their side effects. This study is in line with the study carried out by Cohen EJ, et al, 2012 which showed that treatment consists of topical antiviral agents, including ganciclovir, idoxuridine, and vidarabine. The purpose of the treatment is to reduce virus shedding and the chance of the development of keratitis.

Conclusions

This study specifically sought to determine the prevalence and associated risk factors to the etiologies and management strategies of viral conjunctivitis among patients receiving eye care services in JRRH

The study established that viral conjunctivitis was more prevalent in people aged 25-40, males than females, more in urban areas than rural areas and there is a less significant prevalence in people with URTI.

The study established that the associated risk factors for causing viral conjunctivitis are urban places, crowded places, contact with friends, and hospital grounds. The study also revealed that the risk factors could be systemic diseases like HIV/AIDs, TB, DM, and visiting endemic places.

The study also revealed that management strategies for viral conjunctivitis could be both self-limiting and the use of different topical treatments to embark on its severity.

Recommendation

There should be massive sensitization put in place by the government to increase people's awareness of the risk factors for acquiring viral conjunctivitis.

Isolation of people from endemic places to prevent the rapid spread because viral conjunctivitis is too contagious. And finally, the government should put up more specialized hospitals (eye clinics) to increase accessibility to eye care services.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
CAF	Chloramphenicol
DM	Diabetic Mellitus
DNA	Deoxyribonucleic acid
ED	Emergency Department
HIV	Human Immunodeficiency Virus
HSV	Herpes Simplex Virus
HZV	Herpes Zoster Virus
JRRH	Jinja Regional Referral Hospital
MOH	Ministry Of Health
PCR	Polymerase Chain Reaction
RNA	Ribonucleic acid
TB	Tuberculosis
TEM	Traditional Eye Medicine
TEO	Tetracycline eye ointment
URTI	Upper Respiratory Tract Infections
WHO	World Health Organization
X Beta N	Betamethasone and Neomycin

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Conflict of interest

The authors have no competing interests to declare.

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