

Ocular Manifestations of Rubella Virus Disease in a 32-Year-Old Female Patient Case Report

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Abstract

Rubella (German measles) is a viral disease that affects all age groups. It is spread through contact with airborne droplets of the virus found in the cough or sneeze of infected people. It can also be spread through sharing of cutlery and drinks with infected persons. Following rubella infection, symptoms may be nonspecific as with most viral infections, and may include: arthralgia, cough, runny nose, low grade fever, maculopapular rashes, and lymphadenopathy. Rubella infection cannot be clinically differentiated from other viral diseases based on symptoms. However, it is important for clinicians to know symptoms which may be suggestive of rubella for quick differentials and implementation of precautionary measures against its spread, hence this case report. In this study, we report a case of rare ocular involvement of the third cranial nerve in a 32-year-old black woman with rubella which resulted in pain on superior eye movement and partial eyelid ptosis. The patient also reported experiencing blurred vision, light sensitivity, and objects appearing washed out. All her symptoms appeared 17 days after she had embarked on an international travel (through Ethiopia) and sharing a can of drink with a child who she did not know his measles, mumps, and rubella vaccination status. She tested positive to rubella immunoglobulin *M* test. However, all of the patient's ocular symptoms resolved 6 weeks after their onset following the resolution of the rubella symptoms.

Keywords: Cranial nerve palsy, eyelid ptosis, photophobia, rubella

INTRODUCTION

Rubella (German virus) is a viral disease infection affecting all age groups.^[1] It is transmitted through contact with contaminated air droplets such as saliva and sneeze or through mother to child transmission.^[2] Symptoms of rubella in an adult may include lymphadenopathy, red rash, mild fever, general body ache, and sore red eye.^[1] However, clinical presentation may vary from a child to an adult or when rubella is transmitted from a pregnant mother to her fetus.^[3] Just like other viral diseases, there is no known cure for rubella; however, it can be prevented through vaccination before exposure to the virus.^[1,4] Postexposure, the mainstay of its management is targeted toward the promotion of personal hygiene, quarantine, and management of the presenting symptoms. Although vaccination has been identified as very effective in the prevention of rubella, many people in developing countries are yet to be vaccinated against rubella; therefore, making this virus endemic and of great public health concern in these

places.^[5] Rubella infection cannot be clinically differentiated from other viruses based on symptoms.^[6] However, it is imperative to know some of the symptoms that maybe suggestive of rubella to enable a clinician to make quick differentials and implement precautionary measures against its spread. Hence, this case report presents an unusual ocular presentation of rubella virus in a 32-year-old female patient.

CASE HISTORY

A 32-year-old female of black descent presented to the ophthalmology department of the hospital with complaints of severe eye pain on looking up, which was worse on the left

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eye. She also complained of blurred vision in the two eyes, sensitivity to light, objects appearing washed out, sandy sensation in the eye, painful swellings in front of and behind the ears which all started 1 day prior to presentation. There was a mild generalized headache, low-grade fever, anorexia, and body ache. She had an episode of watery stool that lasted for 7 days. The patient had no sexual exposure for the past 3 years. She had a positive history of international travel (17 days prior to the onset of symptoms) and a positive history of sharing a can of drink with a 1 year and 9 months old child on arrival to Nigeria. The patient could not recall any experience of watery discharge from the nose nor runny nose, and there was no history of ocular trauma. She reported a positive history of suffering from measles as a baby, but was not aware if she was vaccinated against measles, mumps, and rubella (MMR). The patient did not have a cat and had no history of coming in contact with one. There was no family history of glaucoma. The patient's examination on the first day of visit revealed a visual acuity of $6/12^{+1}$, $6/12^{-1}$, and $6/12^{+1}$ for the right, left, and both eyes, respectively, which did not improve with a pinhole. External eye examination showed restricted upward gaze with mild ptosis of the upper eyelids [Figure 1]. There was bulbar conjunctival injection in both eyes. Ocular motility test revealed a restricted upward gaze of the two eyes. Internal eye examination revealed nothing peculiar as the disc was healthy without any sign of neuritis. Intraocular pressure (IOP) examination revealed a pressure of 14 mmHg OU at 14:25 pm. Color vision test using Ishihara pseudoisochromatic plates showed a red green deficiency.

Physical examination for the verification of the inflamed lymph node showed that there were two inflamed pre- and postauricular lymph nodes [Figure 2]. Patient's temperature was 38°C , blood pressure was 122/82 mmHg, with a pulse rate of 78.

The patient was referred to the laboratory session of the hospital for packed cell volume (PCV) test with differentials, HIV I and II tests, erythrocyte sedimentation rate (ESR), MMR immunoglobulin test, a blood culture, and urinalysis test. The results for the PCV test showed ESR test was

normal. HIV I and II tests were nonreactive. Rubella test was carried out [this showed neither the immunoglobulin M (IgM) nor the IgG], the blood culture did not detect any abnormalities, and urinalysis was normal.

Following the examination, the patient was placed on acyclovir eye drops, prednisone 50 mg $\text{bd} \times 1/52$, artificial tears, erythromycin 500 mg bid, paracetamol, and 1000 mg bids. Lots of water, bed rest, and vitamin A supplement was recommended. Patient was referred to a general physician for the management of a suspected case of rubella. Further recommended examinations included optical coherence tomography (OCT) examination and a computed tomography (CT) scan.

Three days after the patient's first visit to the clinic, the patient came back without an OCT result (distance to the place of test was stated as a constraint toward going for the test by the patient). Further, she reported of the appearance of five more swollen lymph nodes on the back of the neck (cervical lymph nodes), one at the breast region of each breast and a generalized maculopapular rash which was very itchy. Patient reported reduction in the ocular pain with eye movement postappearance of the rashes. Patient also reported the blurred vision to have reduced; however, colors still appeared washed out to the patient.

On examination, visual acuity as tested with Snellen chart was 6/9 in both eyes, color vision still showed a red green deficiency, conjunctiva showed the presence of mild follicles on the tarsal bulbar conjunctiva, IOP was at 13 mmHg at 9:33 am, patient's temperature was 38.5°C . Rubella IgM test was positive, and HIV I and II were nonreactive. Physical observation was positive for generalized maculopapular rash and lymphadenopathy [Figure 3]. Definitive diagnosis of rubella virus disease was hereafter reached.

Following these observations, the patient was advised to continue on the eye drops while on quarantine. Four weeks after the patient's first visit to the clinic patient came in for a review, with no visual complaints. On examination, visual acuity was 6/6, IOP was 13 mmHg, color vision was normal, there was no lid ptosis, ocular muscle rotation was normal, and HIV I and II were nonreactive [Figure 4].



Figure 2: Inflamed postauricular lymph node.



Figure 1: Droopy eye lids as observed in patient.

DISCUSSION

This report presents a case of ocular involvement of the CN III in a 32-year-old rubella patient. The patient presented with blurred vision in the two eyes, sensitivity to light, objects

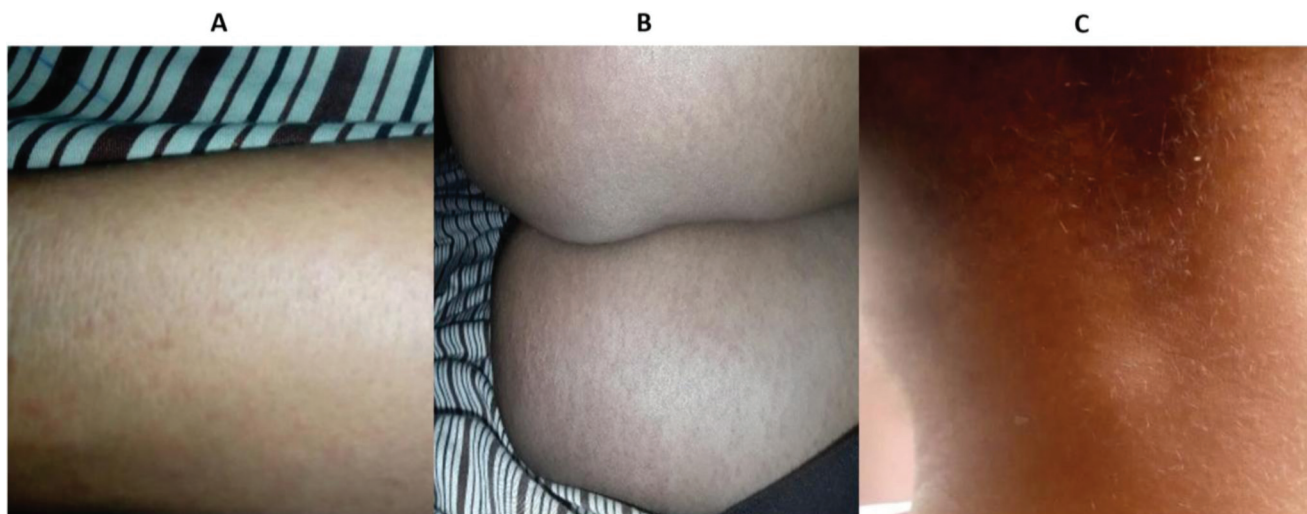


Figure 3: Maculopapular rashes on hand (a) and knees (b), inflamed posterior cervical lymph nodes (c).

appearing washed out, sandy sensation in the eye, painful swellings in front of and behind. The clinicians through series of tests ran on the patient were able to arrive at a conclusion, but some very vital tests (such as OCT and CT scan) which could have thrown more light on this case were not performed due to distance and cost of the examinations. However, the report hopes to provide a guide for future references in the event of a similar ocular presentation in a rubella patient.

The differential diagnosis considered for this patient included measles, HIV, mononucleosis, tuberculosis, and chikungunya virus; however, the final diagnosis reached was rubella. The diagnosis based on the elimination of symptoms. For example, the patient's symptoms though similar to measles were ruled out as not measles based on the fact that the patient had a positive history of measles as a child. This is because people often develop active immunity against measles after exposure to the virus. Similarly, though patient had shown symptoms of early HIV seroconversion, patient had a negative history of blood transfusion, sexual intercourse, and sharing of sharp objects. Although the patient had shared a bottle of canned drink with a child, this carried very little risk of transmitting HIV virus, it was pertinent to check HIV serostatus. This test came back negative, which was good although not definitive. Further to that our index case had a positive social history of sharing a can of drink with a child, this may have been a means of transmission of mononucleosis; however, though patient had shown symptoms similar to mononucleosis, she nonetheless did not have any symptom of cough or sore throat, which is a major symptom of mononucleosis. Likewise, the patient's symptoms were similar to those of a patient with tuberculosis; however, the Mantoux test was nonreactive at the time of the test and neither the child whom the patient shared a can of drink nor patient's family members had tuberculosis. In addition, chikungunya virus disease was ruled out. Finally, the diagnosis of rubella was reached following the social



Figure 4: Resolved droopy eyelid.

history of the patient, some of the observed symptoms, and a positive rubella IgM test.

Rubella infection has been associated with cough, runny nose, low-grade fever, maculopapular rashes, lymphadenopathy, etc.^[1,2] In the eye(s), rubella in an adult is often associated with teary eyes and conjunctivitis.^[1] However, ptosis is reportedly noticed for the first time in the index case.

Rubella (German measles) is a class of *Togavirus*, and *Rubivirus* genus.^[7] It may manifest in various ways; however, in the index patient, rubella infection had manifested in the eye in the form of sudden onset of eye pain upon upward eye movement. On examination, it was found that the patient had a restricted upward gaze in the two eyes, a sluggish pupillary reaction, and mild lid ptosis on both eyes (which when compared with her previous pictures were absent). This may be the first time that ptosis had been noticed in a rubella patient. In the index case, the patient had presented without any of the above-mentioned possibilities but had tested positive to rubella ELISA virus test. In addition, the patient's ptosis and other accompanying ocular symptoms had resolved following the clearing of the rubella red rash, therefore, suggesting that the ptosis may have been associated with rubella. In the past, cases of partial third nerve palsy with mostly ocular muscles involved in eye movement had been reported following

MMR vaccination.^[8] This had been described as the neurotrophic effect of MMR vaccination. Reports had also shown that Rubella virus had a chronic neurotrophic effect on people who may be affected. In the case reported, patient's symptoms resolved sequel to the end of the viral infection as such, we hypothesize (or suspect) that there had been a neurotropic effect/impact of the virus on the patient during the course of the rubella infection. The neurotrophic effect we suspected had affected the third cranial nerve (CNIII) of the patient, which had resulted in the partial dropping of the patient's eyelid, sluggish pupillary reaction (constriction), and restricted eye movement. The mechanism behind these effects can be explained by the fact that the CNIII innervates the superior rectus muscle, the sphincter muscle, and the levator palpebrae superioris muscle which are responsible for superior eye movement, constriction of the pupil, and elevation of the lid, respectively.^[9] The neurotrophic effect may also be responsible for the reduction in the best-corrected visual acuity of 6/12⁺¹ and 6/12^{a 1} in the right and left eyes, respectively, of the patient. Reduction in visual acuity in this patient is similar to the report by Damasceno *et al.* who had also reported a reduced visual acuity in an adult patient with rubella.^[6] In addition, Manzotti *et al.* had earlier reported a partial CNIII palsy post-MMR vaccine in a 20-month-old baby which went unresolved after 5 years.^[8] Although optic nerve involvement has been reported among patients who received MMR vaccination and among those who had rubella virus disease, the internal eye examination of the index patient was not spectacular for optic nerve involvement.^[10]

This case, therefore, suggests that rubella can affect the CNIII in such a way that there could be a partial paralysis which could result in lid ptosis, which completely resolved after the rubella virus may have run its course. This means that eye-care practitioners should be aware of the possible early manifestation of rubella to help in its curtailing and management to avoid its spread. In addition, associated

ocular symptoms of rubella should be monitored and treated based on symptoms to aid patient relief.

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Conflicts of interest

There are no conflicts of interest.

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