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Otoacariasis: Clinical Characteristics and Outcome: A Study in Central Part of Nepal

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ABSTRACT

Background

Tick and mite infestation within the ear canal is Otoacariasis. Tick is found all over the world and more prevalent in tropical and subtropical region like Nepal. Tick causes significant morbidity, economic loss, even mortality in both human and animals so it is public health problem. The aim of this study is to find demographic pattern, to evaluate the clinical presentation, treatment and complications due to tick bite of patients presenting in our hospital.

Methods

A cross-sectional study was conducted in the Department of ENT-Head and Neck Surgery, Bharatpur Hospital, Bharatpur, Chitwan, Nepal Bharatpur Hospital, Chitwan, Nepal from October 2023 to February 2024. Patients who had presented in ENT OPD or in Emergency with ear symptoms were evaluated by Otolaryngologists. After identifying the exact location of tick, with the help of head light or otoscope, it was grasped by alligator forcep and removed.

Results

There were 47 cases enrolled in this study. Female (38) outnumbered male (9) with ratio 4.2:1. Age of the patients was 1 through 72 years with mean age 33.14. Most common symptom was pain. Most of the patients were children below 11 years followed by young adults in between 21 to 30 years. Preferred location was posterior wall of external auditory canal (36.17%). Tympanic membrane perforation, facial nerve palsy was not seen in anyone. Systemic tick borne diseases were not seen in any patients.

Conclusions

Human tick infestation is common in Nepal during dry season. Most patients had pain as presenting symptom. Tick can be removed in OPD without complications. Tick borne systemic diseases were not seen in otoacariasis.

Keywords: hard tick; otoacariasis; soft tick.

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INTRODUCTION

Tick and mite infestation within the ear canal is Otoacariasis. Tick is found all over the world and more prevalent in tropical and subtropical region like Nepal. There are different species of ticks across the globe with diversity of geography, livestock. Ticks belong to two major families, the Ixodidae or hard ticks, and the *Argasidae*, or soft ticks. Tick infestation is sporadic in all month but more common during dry season (October to February) in our parts.[1] The client visit hospital with complain of pain, ear fullness, tinnitus, crawling sensation, facial nerve palsy, fever, rashes, joint pain. Tick causes significant morbidity, economic loss, even mortality in both human and animals so, it is public health problem. It is the first study of its kind done in our parts although some cases reports are published so it may help to fulfill knowledge and theoretical gap about the problem. We aimed this study to find demographic pattern, to evaluate the clinical presentation, treatment and outcome as cured or complications due to tick bite in patients presenting in our hospital.

METHODS

This is an observational, cross-sectional study conducted in Bharatpur Hospital, Chitwan, Nepal from October 2023 to February 2024. Ethical clearance was taken from Institutional Review Committee (IRC) of Bharatpur Hospital (Ref. No. 079/80-26). This hospital is located in central part of Nepal which is Terai region. Non probability purposive sampling technique were used for data collection. Patients who had presented in ENT OPD or in Emergency with ear symptoms were evaluated by Otolaryngologists. Otoscopic examination, suction clearance of ear canal if needed, was performed. Blackish faeces in meatus or canal herald the presence of tick inside the ear. After identifying the exact location of tick, with the help of head light or otoscope it was grasped by alligator forcep at head as close to skin as possible. If head is deep to skin, abdomen was grasped. Tick was pulled with steady force without twisting around. Removing the mouth part is important because saliva contain toxins that cause inflammation in tissue. Patients received analgesic, antibiotics containing ear drop and antibiotics for otitis externa. They were asked to follow up every week to assess the complications till 15 days. The removed tick was kept in absolute alcohol and discarded. Identification of tick species was not done due to lack of resources in this hospital or nearby. We collected the data, summarized, analyzed them and reported the results.

RESULTS

There were 47 cases enrolled in this study. Female (38) outnumbered male (9) with ratio 4.2:1. Age of the patients was 1 through 72 years with mean age 33.14 and standard deviation 21.19. Most of the patients were children below 11years followed by young adults in between 21 to 30 years (Table 1).

Table 1. Showing numbers of patients with age range. (n=47)

Age Range	Frequency (%)
1-10	12(25.53%)
11-20	2(4.25%)
21-30	8(17.02%)
31-40	6(12.76%)
41-50	7(14.89%)
51-60	6(12.76%)
61-70	5(10.63%)
71-80	1(2.12%)

All the patients presented within 4 days of symptoms, mean 3.59 days and standard deviation 1.87. The most common presenting symptom was pain (97.8%), followed by itching in the ear. One patient complained of tinnitus along with pain. Result showed that 31 people had visited jungle within a week of symptoms. Parents of 2 children had also recent jungle visit. Preferred location was posterior canal wall (36.17%), followed by anterior wall (19.14%). Ticks were most commonly found in Right ear (57.44%). 39 ticks were found alive and 8 were dead. Tick faeces were seen in 30 cases and none in 17 (36.17%) (Table 2).

Table 2. Showing site of attachment of tick in ear canal including tympanic membrane. (n=47)

Location	Frequency (%)
Floor	8(17.02%)
Anterior wall	9(19.14%)
Posterior wall	17(36.17%)
Superior wall	7(14.89%)
Tympanic membrane	5(10.63%)
Tragus	1(2.12%)

Figure 1. Showing removed tick engorged with blood.

Most of the ticks (42) were removed in first attempt in OPD but 5 children were asked to follow after pain relief and finally removed in OPD after 3 days. Laceration and bleeding from removal site was seen in 20 cases (42.5%), which was minimal and bleeding stopped immediately without intervention. Tympanic membrane perforation, facial nerve palsy was not seen in anyone. There was single tick in each ear. Twelve patients had developed otitis externa before hospital visit and managed with antibiotics and analgesics. One adult experienced ear pain for two week after the tick removal and managed with Amitriptyline. None of the patient developed systemic tick borne diseases. All cases were managed in OPD without admission in ward.

DISCUSSION

Ticks are mandatory blood sucking ectoparasites and fauna is seen in environment like grass, leaves, bushes, shrubs. They live on body of livestock and pets. Humans get these arthropods in their bodies by contact with livestock, pets or external environment. Climate change and landscape modifications by humans have favored ticks spread and have increased the incidence of Tick - borne Diseases. Tick loves warm and moist area of human body. It may attach any part of body and migrates to hide in ear canal. Ticks pass through the stages of egg, larvae, nymph, and adult. The larvae and nymph bite. Once a tick has found a suitable place to feed, it uses its mouth-parts to cut through the host's skin which is painless piercing, inserts a feeding tube into the wound and then feeds on blood until it is full. Its saliva contains neurotoxins, immunosuppressant protein which sops up IL-2 and prevents division of T-Cell resulting in immunosuppression. Ticks secrete immunosuppressive molecules that inhibit host immune responses and provide survival advantages to pathogens,[2] Ticks are vector of zoonosis. Ticks can be infected with bacteria, viruses, or parasites.[3] Some of the most common tick-borne diseases are Lyme disease, Babesiosis, Ehrlichiosis, Rocky Mountain Spotted Fever, Anaplasmosis, Southern Tick-Associated Rash Illness, Tick-Borne Relapsing Fever, and Tularemia

Otoacariasis is common disease in the mid part of Nepal where this hospital is located. This disease is endemic but incidence is higher in winter season so this study was conducted from October to February. As such there is not any predilection but female and children are more affected by tick. Females visit jungle to collect fodder, wood, leaves. They are more engaged in farm, garden which is the fauna for tick. These arthropods hide in side long hairs and migrate into ear canal which is dark and warm space, favourable for tick. Closeness of child with mother increased the risk for children to get infested. In our study 25% are children. Bite risk was highest for children aged 5 years or less, with a secondary peak in persons aged 50–70 years (male to female ratio is 1:4.2. All the patients presented within 4 days of symptoms, mean 3.59 days. These findings are similar to other studies.[4] This early visit is due to predominant symptom pain which was present in 97.8%. Pain was the most common symptom to visit hospital as seen in other studies.[5] Other symptoms were itching, crawling sensation. One patient presented with tinnitus which subsided after tick removal. Blackish beaded faeces in meatus or canal heralds the presence of tick inside ear canal so meticulous search is needed if not seen obviously. Tick faeces were present in 63% cases in this study. None of the patient presented with facial nerve palsy, hearing loss, ear bleed however tick infestation may present with unusual symptoms.[6] Intra aural tick infestation can cause acute labyrinthitis.[7]

Ticks produce neurotoxins that cause facial nerve palsy. Behind the ear, scalp, and neck attachments are reported as regions of high risk.[8] These toxins are released by salivary glands. The postulated

pathophysiology of nerve paralysis is perforated tympanic membrane, dehiscent facial canal, congenital dehiscence, direct invasion. Ten studies estimated the possible duration between tick bite and facial nerve palsy, averaging 8.9 days.[9] Contrary to the popular toxin theory, tick borne rickettesial infection can cause nerve palsy[10], tick bite can cause sudden sensorineural hearing loss.[11] Hard tick can cause isolated facial nerve palsy.[12] The preferred site of attachment was posterior canal wall (36.17%) followed by anterior canal wall (19%) and tympanic membrane (10.6%). Most of the ticks were alive (82.9%) and remaining were dead. No tick was found in walk during examination. Piercing of skin is painless so person becomes unaware in early stage of attachment. Patients put ear drops, homemade liquids inside the ear before coming to hospital and tick die. This may be the one reason of dead tick. Sometimes fully engorged tick gets stocked in canal and dies itself.

Tick produces local anesthetics and anti-coagulant so skin piercing is painless and blood sucking is easy. They hide their head inside skin; regurgitate content from abdomen which contains microorganisms and toxin. Excessive manipulation of abdomen increases the risk of disease transmission. Removal of head part is crucial to prevent disease transmission and otitis externa.[1] Alternative method of tick removal is opening of abdomen by forcep, suctioning its content and left it for few days then removal of remaining dead part later.[13] Tick should be removed as soon as possible because longer stay of multiple ticks may produce more toxins and severe symptoms. We removed most of the ticks (89%) in first attempt with alligator forcep in OPD without anesthesia however five children (11%) were advised to follow up after 3 days and removed in OPD. None of the patients required general anesthesia and hospital admission. Five cases had tick attached in tympanic membrane but none had tympanic membrane perforation after mite removal.

CONCLUSIONS

Otoacariasis is common during dry season of the year in Nepal. Pain is the most alarming symptom of tick infestation. Female and children are more vulnerable to acquire the disease. Early removal of tick decreases the risk of Tick-borne systemic illness. Knowledge of demographic pattern, clinical feature and treatment procedure help to decrease the occurrence of disease, then decrease morbidity, mortality and ushers the strategic plan for public health management and safety. Cross-sectional study has its own limitations. Multicenter, multidisciplinary, cohort study may give broader picture about the disease.

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