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RESEARCH ARTICLE

A STUDY OF DIPHTHERIA MENACE IN KUMAUN REGION OF UTTARAKHAND STATE IN INDIA

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ABSTRACT

Diphtheria a vaccine preventable disease continues to affect children in Uttarakhand. WHO case definition for surveillance was used to identify diphtheria cases and describe their demographic characteristics. Sixty-one cases of diphtheria reported for treatment during six year period from 2005-2010. Mean age of cases was 5.16 ± 2.9 years and nearly 71% presented in acute phase of the disease. Nearly all cases were unimmunized for DPT but had received oral polio vaccine. There is an urgent need to increase awareness and acceptability of immunization program for all childhood diseases.

Keywords: diphtheria, immunization, vaccine.

INTRODUCTION

Diphtheria, a bacterial infection of the upper respiratory tract commonly affects young children. It spreads through close contact or droplet infection from case or carrier. The severity of disease depends on the toxigenicity of the affecting strain and host immune response. Man is the only reservoir for the organism and carrier rates in the community may vary from 0.1 to 5%. [1] Primary vaccination develops antibodies in 94-100% children [2] which falls if booster doses are not given. [3] Successful immunization strategies has virtually eliminated diphtheria from developed countries but outbreaks are still encountered in our country. [4, 5, 6] In India, reporting of diphtheria cases is mandatory with the state health authorities yet many cases go unreported.[7] We describe the demographic characteristics of diphtheria cases over a six year period from a tertiary care hospital in Uttarakhand to bring to light the need for increase in diphtheria surveillance.

MATERIAL AND METHOD

Retrospective data were collected from hospital records of diphtheria cases reporting for management during the period 2005-2010. The hospital is located in Nainital district, Uttarakhand. The catchment area of the hospital includes the neighboring districts of Uttar Pradesh and Kumaon region of Uttarakhand. It is a 550 bedded hospital with an annual indoor pediatric admission of about 3500 cases. For this report, archived hospital records with a case diagnosis of Diphtheria were retrieved with the permission of the hospital authorities. Information from case records was abstracted on a structured questionnaire which included age, sex, religion, place of residence, immunization status, clinical signs and symptoms, laboratory test results, treatment given and outcome. WHO case definition for surveillance was used for ascertaining probable and confirmatory diagnosis. [1]

RESULTS AND DISCUSSION

Overall, 61 cases of diphtheria reported to the hospital during 2005- 2010. Of these, 13 cases did not get admitted and were advised treatment in outdoor department. Year-wise distribution of cases is given in Table I.

Results of 48 diphtheria cases admitted for management are being presented here. Majority (41, 85.4%) cases presented during the months of August to November. Mean age of cases was 5.16 ± 2.9 years, 62.5% (30) were males with equal distribution between Hindus and Muslims. Most cases (34, 70.8%) presented in acute phase with fever, throat pain, swelling of neck and clinical examination revealed bull neck with bilaterally enlarged jugulo-digastric lymph nodes, greyish white membrane over tonsils, posterior pharyngeal wall and/or uvula which bled on touch. Five cases (10.4%) diagnosed with post-diphtheritic myocarditis presented with difficulty in breathing, easy fatigability, swelling over feet following fever two weeks ago. Clinical examination revealed tachycardia with systolic murmur, echocardiography confirmed mitral regurgitation in three cases and mitral with tricuspid regurgitation in two cases. Nine cases (18.8%) presented with history of fever three weeks ago, nasal regurgitation of fluids and nasal twang in voice and were diagnosed with post-diphtheritic bilateral palatal palsy.

Immunization status of the cases was enquired from the parents since the immunization cards were not available. Nearly 96% (46) cases were un-immunized for diphtheria due to lack of awareness though they reported having received oral polio drops. Two (4.1%) cases were partially immunized as the parents were not aware of the importance of booster doses and feared side effects like fever and pain at injection site.

Table I: Year wise distribution of diphtheria cases

Year	2005	2006	2007	2008	2009	2010
Indoor cases	0	6	18	2	6	16
Outdoor cases	0	0	12	0	0	1
Total cases	0	6	30	2	6	17

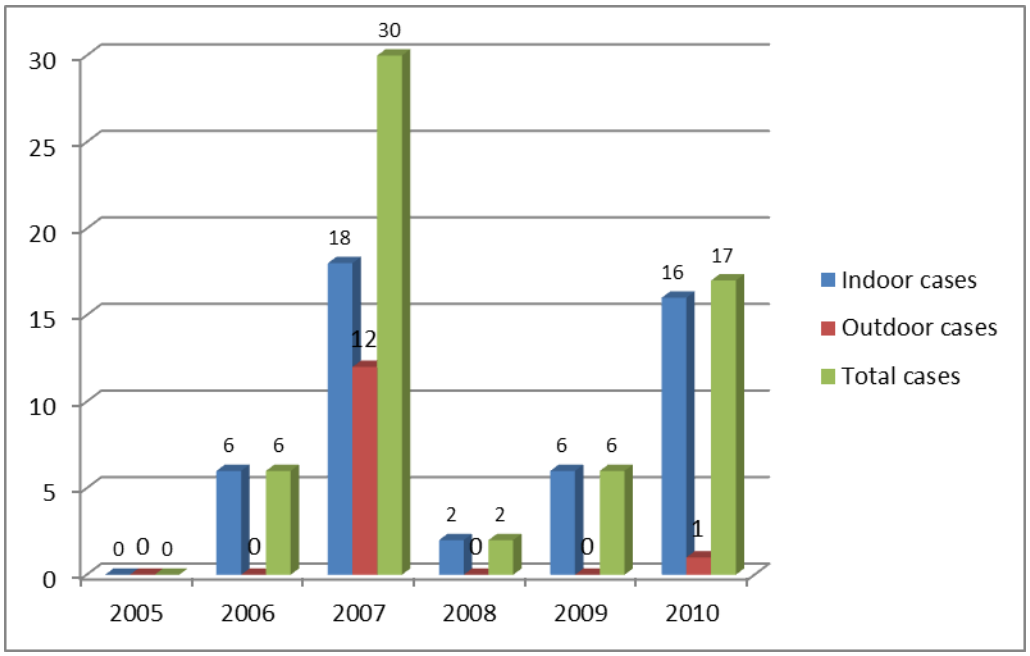

Figure 1: Shows Year wise distribution of diphtheri

Smear examination and culture was negative for diphtheria in all cases. All cases were administered oral erythromycin but diphtheric antitoxin (DAT) could not be given due to non-availability. Outcome of only 31 of 48 cases was known with a case fatality rate of 35.48% (11 of 31 cases whose outcome was known). Ten cases were referred for ventilatory support to other centers, seven cases left the hospital against medical advice and hospital records of five cases could not be retrieved.

DISCUSSION

Diphtheria, an acute bacterial infection in children has the potential of being eliminated through universal immunization program. However in Uttarakhand, only 67% and 80% children between 12-23 months of age have received 3 doses of DPT and polio vaccination respectively [8] and about 7.2% children have not received any vaccination. [9] In our study, most cases (96%) had not received DPT vaccine though they reported receiving oral polio vaccination. Lack of awareness among parents regarding need for immunization against other diseases besides polio, incomplete knowledge of immunization schedule, fear of side effects are some of the reasons for not immunizing the children.[10] Piggy backing on pulse polio campaign to increase the awareness and acceptability of immunization for other childhood diseases should be considered. In our study, the median age of cases was 5 years but about 33.3% cases were more than 5 years of age. Increase in age of diphtheria cases reported from Indian studies could be attributed to low booster coverage [4, 6, 11] and inclusion of booster dose coverage as a performance indicator of immunization program has been suggested. [6]

Diphtheria outbreaks continue to be reported from India. [4, 5, 6] The microbiological confirmation is low (7% - 36.7%) due to early use of antibiotics, lack of expertise in sample collection etc. [12, 13] In our study, laboratory diagnosis could not be confirmed for any case. Acute infection carries a high mortality and early initiation of antibiotics and DAT are essential to improve outcome. However, shortage of DAT has been reported from India and other developing countries. [14, 15] In our region surveillance especially during the months of August to November should be carried out for early detection of outbreaks. During the year 2010, 15 of 17 probable diphtheria cases were reported from among residents of Champavat district of Uttarakhand, which necessitates investigation.

CONCLUSION

Most cases which had not received DPT vaccine due lack of awareness among parents regarding need for immunization against other diseases besides polio, incomplete knowledge of immunization schedule, fear of side effects are some of the reasons for not immunizing the children. There is a need for health authorities to report both on probable and confirmed diphtheria cases to avoid under-reporting.

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