ORIGINAL ARTICLE

A STUDY OF DIPHTHERIA CASES AMONG HOSPITAL ADMISSIONS IN AHMEDABAD

Hiral H Shah[1], Bijal H Shah[2], Deepa A Banker[3], Meet A Leuva[4], Meghavi Patel[4], Darshan S Patel[4]

Author's Affiliations: [1]Associate Professor Dept. of Pediatrics, AMC- MET, Ahmedabad; [2]Associate Professor; [3]Professor; [4]Resident, Dept. of Pediatrics, NHL Municipal Medical College, Ahmedabad, Gujarat
Correspondence: Dr Bijal S. Shah Email: drsaurabhshah72@yahoo.com

ABSTRACT

Introduction: Even after 20 years of UIP diphtheria is still prevalent showing up and down trends in India. India contributes about 19 to 84% of total burden worldwide and many of time it is unidentified and notified. Present study is aimed to study Diphtheria cases in a tertiary care hospital Ahmedabad from January 2012 to December 2015

Methodology: Total 74 confirm throat swab smear or culture for C Diphtheria positive patients were included in study. Their age, immunisation status, response to treatment in form of throat swab clearance of bacilli, complications and mortality was noted and analysed.

Results: 38(51.35%) were from 5-10 years age groups. Inappropriate booster doses and waning immunity in older age is responsible for shifting of age pattern . 9% of cases were fully immunised and had very milder form of disease. 56.65% were unimmunised had more severe form, complications, delayed clearance of throat bacilli and mortality. 90% patients throat swab cleared within 72 hours of starting treatment showing sensitivity of bacilli to slandered treatment. 12(18.9%) patients were expired mostly due to cardiac complications.

Conclusion: Thus strengthening of routine immunisation, early identification and timely intervention can definitely overcome the resurgence of disease.

Keywords: Diphtheria, Immunisation, VPD, Diphtheria myocarditis, epidemic

INTRODUCTION

In 21st century with emergence of newer diseases like swine flu, zeka virus, HIV we have a false security of declining incidence of vaccine preventable diseases(VPD) .Diphtheria , a very common VPD ,still persistent in India without much decline in last decade.[1,2] After introduction of UIP in 1985 there was a sudden decline in incidence of diphtheria by 1999 over worldwide including India (about 79%).But after 2000 there are different outbreaks at different districts of India.[3, 4, 5]India still contributes 18-84% of overall world load of Diphtheria.[6, 7] It is still endemic in our country. The last decade has seen resurgence of diphtheria in both developed and developing countries where it was previously well controlled [8,9] it is believed that these data are only tip of the iceberg, still identification and notification of all cases is lacking.[10,11] Diphtheria vaccination is a one of the very safe and most effective method of preventing cases and outbreaks.[12,13,14], provided it is completed with all boosters. Control of disease can be obtained by strong awareness amongst people for routine immunisation, mass immunisation campaigns.

Present study was done at a tertiary care centre of ahmedabad aimed to study Diphtheria cases trends.

METHODOLOGY

It was cross sectional observational study done over the period of three years January 2012-december 2015 in a tertiary care centre, teaching hospital and medical college of Ahmedabad. Ethical approval was taken.

Aim of the study was to study age of occurrence, immunisation status, complications, mortality and response to standard treatment in form of throat swab clearance of bacilli.

All the C.diphtheria swab/smear positive cases were included in study. Informed consent was taken. Detail history including age, sex, demographic profile, clinical complains were noted as per proforma.Immunisation history was taken in details. According to standard UIP guidelines if child had taken all vaccines up to his/her age was considered as fully immunised. Even a single dose is remained child was considered as partially immunised. And child who

had not taken any immunisation at al considered as unimmunised. Patients were investigated further and managed as per standard protocols. Bacterial clearance was observed by throat swab routine microscopy at 24 hours interval and throat swab clearance time was noted in all .Different complications including carditis, acute renal failure, palatal palsy, mechanical obstruction, bronchopneumonia were noted. Ultimate outcome of all patients were noted.

All the observation s were tabulated and analysed statistically.

RESULTS

Total 74 patients confirmed diphtheria positive patients were included in study. 48(64.86%) were male and 26 (35.13%) were female.

Table 1: Distribution of diphtheria according to age group (N=74)

Age group (In Years)	No. (%)
1-3	12 (16.2)
3-5	16 (21.62)
5-10	38 (51.35)
>10	8 (10.81)

Table 2: Immunisation status of study participants

Vaccination status	No (%)
Fully immunised	6 (8.10)
Partially immunised	26 (35.13)
Totally unimmunised	42 (56.75)

Table 3: Outcome of study participants

Immunisation status	Discharged (%)	Expired (%)	Total
Fully immunised	6 (100)	0	6
Partially immunised	22(84.61)	4 (15.39)	26
Totally unimmunised	32(76.19)	10 (23.81)	42

Table 4: Throat swab clearance time

Throat swab clearance	No (%)
At 24 hrs	2(2.7)
48 hrs	30 (40.54)
72 hrs	32 (46.0)
>72 hrs	10 (10.81)

Table 5: Complications and mortality

Complications	No (%)	Mortality (%)
Myocarditis	26(35.0)	12(46.15)
Palatal palsy	6(8.1)	0
Laryngeal obstruction	8(10.81)	2(25.0)

Maximum no of patients were 5-10 yrs (51.35%) showed us recent shift in age of patients from less than 5 year age children to older age groups.

32 (44%) patients were from urban slums and 21(56%) were from rural area. And most of (95%) patients were from Muslim community.

Total 60 (81.08%) were discharged successfully and 14(18.9%) patients were expired.

We observed maximum mortality in the patients who were totally unimmunised. Even patients who were partially immunised received only one dose of vaccine. Most of them had myocarditis and they came very late to centre. The patients in which interventions were started within 72 hours of onset symptoms there was minimum morbidity and all were successfully discharged.

After starting of treatment we have observed for throat swab clearance

Almost 90% patients showed bacterial clearance within 72 hours of starting treatment. The patients who had persistent bacteria were all totally unimmunised and had bad outcome.

We observed myocarditis was commonest complication leading to mortality. More then one complications were present in many patients, still the reason for mortality was myocarditis.We have observed severe form of disease with many complications in patients who were totally unimmunised.

DISCUSSION

Diphtheria epidemics are still persistent without much decline in many parts of India. Lots of outbreak studies of different districts like Assam [3], Hyderabad [4], Delhi [5] and Maharashtra[9] were done in past decade. Still large no of the cases are not identified and even notified. Vaccine is still a gold standard of prevention of this disease [13, 14]but still even after 32 years of UIP, complete immunisation with all boosters is not reaching the targeted goals.

In our study 51.3% of patients were from age group of 5-10 years. Before introduction of UIP diphtheria cases were maximum from <5 years of age group. In last decade change in age of presentation is observed in lots of studies even in developed world also [15] .this is due to lack of booster immunisation and weaning of immunity of primary doses in later age. During 2015, about 86% (116 million) of infants worldwide received 3 doses of diphtheria-tetanus-pertusis (DTP3) vaccine, protecting them against diphtheria.. By 2015, 126 countries had reached at least 90% coverage of DTP3 vaccine.[12]in India till 2014 DPT3 coverage was 74% as per NRHM data.[12]but again in Gujarat it is 56% till 2014.

In our study almost 92% of cases were either unimmunised or not immunised completely. Only 6(8.10%) patients were fully immunised and they had very mild form of disease and all discharged successfully. Complete immunisation including all boosters is having a strong protective value for disease.[12.13] To prevent outbreaks 90% of children less then 1 year should be immunised with DPT vaccine completely. We have observed a grave outcome, with lots of complications and mortality with even delay in throat swab clearance of bacilli in completely unimmunised patients.

Most of the patients responded to standard treatment showed clearance of bacilli within 72 hours of starting treatment .and 81.08% patients were discharged successfully. Patients who came late and who were totally unimmunised had complications like myocarditis expired.(case fatality rate 18.9%) Thus even in era of high no of resistant bacteria still C.Diphthrie is sensitive to standard antibiotics, provided the treatment is started as early as possible. In Assam study done during outbreak [3] showed case fatality rate only 3.33% while similar study done in Cali [16] showed 12.5% case fatality rate.

CONCLUSION

Diphtheria is still prevalent in our area with the occurrence of disease in older age groups. Complete immunisation is gold standard for prevention and better outcome of the disease. Early identification and timely intervention is gold slandered for treatment.

REFERENCE

1. Manoj V Murhekar and Sailaja Bitraguntar. Persistence of Diphtheria in India. Indian J Community Med 2011 Apr-Jun; 36(2): 164–165
2. K Park. Park's Text Book of Preventive and Social Medicine, 16th Edition, Jabalpur: Bhanot Publishers, 2000; 125-128.
3. Nath B, Mahanta TG. Investigation of an outbreak in Borborooah block of Dirbrugarh district, Assam. Indian J Community Med 2010;35:436-8.
4. Bitragunta S, Murhekar MV, Hutin YJ, Penumur PP, Gupte MD. Persistence of Diphtheria, Hyderabad, India, 2003–2006. Emerg Infect Dis 2008;14:1144-6.
5. Sharma NC, Banavaliker JN, Ranjan R, Kumar R. Bacteriological and epidemiological characteristics of diphtheria cases in and around Delhi – A retrospective study. Indian J Med Res 2007;126:545-52.
6. Singhal T, Lodha R, Kapil A, Jain Y, Kabra SK. Diphtheria–Down but not out. Indian Pediatr. 2000;37:728-38.
7. Ray SK, Gupta SD and Saha I. A report of Diphtheria surveillance from a rual Medical College, Hospital. Journal of Indian Medical Association 1998 ; 96 (8) : 236-238.
8. Patel1 U, Patel1 B, Bhavsar B.A Retrospective Study of Diphtheria Cases,Rajkot, Gujarat. Indian Journal of Community Medicine Vol. XXIX, No. 4, October-December, 2004
9. MN Dravid.M, Joshi S .Resurgence of_diphtheria_in Malegaon & Dhule regions of north Maharashtra.Indian J Med Res. 2008 Jun;127(6):616-7.
10. WHO. Vaccine preventable disease monitoring system, global summary. Available at http://www.who.int/vaccine documents/Global summary/Global summary.pdf. Last accessed on 12th January, 2017
11. WHO vaccine-preventable diseases: monitoring system. 2016 global summary (india and world wide)
12. Immunization. Available at: nrhm.gov.in/nrhm-components/rmnch.../immunization/background update 2016 Last accessed on 12th January, 2017
13. Orenstein WA, Bernier RH, Dondero TJ, Hinman AR, Marks JS,Bart KJ, et al. Field evaluation of vaccine effi cacy. Bull World Health Organ. 1985;63:1055–68.
14. Bisgard KM, Rhodes P, Hardy IRB, Litkina IL, Filatov NN, Monisov AA, et al. Diphtheria toxoid vaccine effectiveness: a case-controlstudy in Russia. J Infect Dis. 2000;181(Suppl 1):S184–7.
15. Galazka Arthr, Robertson Susan. Diphtheria: Changing patterns in the developing world and the industrialized world. European Journal of Epidemiology 1995; 11 (1): 107-117
16. Landazabal GN, Burgos Rodriguez MM, Pastor D; Diphtheria outbreak in Cali, Colombia, August-October 2000. Epidemiological Bulletin 2001;22:3.