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"Diphtheria outbreak analysis at GIMS Kalaburagi"

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ABSTRACT-

Background

Diphtheria is one of the significant health problems in developing countries. It is not only seen in children but also in adults due to low immunization coverage in our country. This study is aimed at analyzing the outbreak of diphtheria at GIMS Kalaburagi in Aug 2019. It mainly involves the upper airway tract and accounts for mortality of 5-10% generally but sometimes even as high as 20% mortality is seen in children below 5 years of age. Despite of universal immunization program(UIP) of diphtheria vaccine many cases of re-emergence or new cases of diphtheria are being detected every year. Hence it becomes necessary for us to study and analyze the diphtheria outbreak and review the literature.

Methods

Total 29 patients (28 students of GIMS medical college, girls hostel and 1 anesthetist been affected in an outbreak which began on August 27th 2019 in Kalaburagi district) are taken for this study.

Results

In 29 cases from the girl's hostel of GIMS Institute it has been observed that

1. This outbreak was a laboratory confirmed outbreak of Diphtheria most likely due to poor isolation and PPE (Personal protective equipment) practices in the wards.

2. Inadequate immunization of medical students against diphtheria.

3. There has been a shift of age group in the outbreak from pediatric to adult age group.

ISSN 2515-8260 Volume 09, Issue 07, 2022

Conclusion

By studying and analyzing the outbreak of diphtheria it has been observed that poor immunization of medical students against diphtheria indicates the need to review the efficacy of immunization program and need for the DPT booster dose in adults, improper PPE practices in the ward while examining the cases has been the cause of acquiring the disease from a pediatrics diphtheria case, this indicated the need for proper PPE practices by the medical students, non-isolation of cases on first day of illness led to spread of the illness among the hostel inmates, this shows the importance of isolation of cases to prevent the spread of the disease.

Keywords

Diphtheria, immunization

Introduction

Diphtheria is an infectious disease caused by Gram-positive facultative anaerobic bacilli Corynebacterium diphtheria. It is an upper respiratory tract infection involving anterior nasal, pharyngeal, tonsillar or laryngeal mucous membranes. The mortality rate, which is generally 5–10%, may be as high as 20% in children below 5 years and adults over 40 years of age[1]. Despite of universal immunization program (UIP) of diphtheria vaccine, many cases of re-emergence or new cases of diphtheria is being detected every year. The disease has been almost eradicated in the developed countries but still it is persisting in the developing countries although the incidence rate has reduced but it accounts for 80- 90% of the global burden. Introduction of diphtheria toxoid in vaccination programs has reduced the mortality and morbidity of diphtheria dramatically world over. However, diphtheria is still a significant child health problem in countries with poor immunization coverage[2]. In countries endemic for diphtheria, the disease occurs mostly as sporadic cases or as small outbreak.

Objectives

1. To study the importance of good PPE practices by medical students in the wards
2. To know the effect of partial immunization in the outbreak
3. To know the need for proper isolation of diphtheria cases
4. To know the importance of early diagnosis and treatment of the cases with diphtheria antitoxin.

ISSN 2515-8260 Volume 09, Issue 07, 2022

Material and Methods

Total 29patients (28 students of GIMS medical college, girls hostel and 1 anesthetist has been affected in an outbreak which began on August 27th 2019 in Kalaburagi district are taken for this study

To begin with the primary case was a student of MBBS final year from girls hostel who visited the ENT department with pain in the throat, fever and dysphagia since 3days, on examination grayish white patch was seen over the left tonsil with congestion and enlarged JD node (jugulodigastric node). Swab has been sent for Albert stain and culture sensitivity which confirmed positive for diphtheria.

Possible source of infection can be the tutorials in pediatric department on 19th and 26th August which all final year students attended without any PPE (Personal Protective Equipment) while examining the diphtheria case

Results

29 samples tested in Microbiology Dept, GIMS were positive for culture (Corynebacterium diphtheria isolated).

Table/Fig 1: Clinical presentation and complications (N-29)

Variables		N	%
Signs and symptoms	Fever	25	96
	Sore throat and membrane	29	100
	Difficulty in swallowing	20	85
	Hoarseness of voice	4	14
Complications		0	0

Table/Fig 2: Vaccination status and chemoprophylaxis

- DPT vaccination status from records and recall

Vaccine	Cases received n(%)
Primary doses of DPT(1,2,3)	22(76)
DPT 1st Booster	12(41)
DPT 2nd Booster	4(13)

- Antibiotic prophylaxis
  - All students in both hostels put on prophylactic antibiotic from august 30
  - Erythromycin 500 thrice a day, Azithromycin given on intolerance

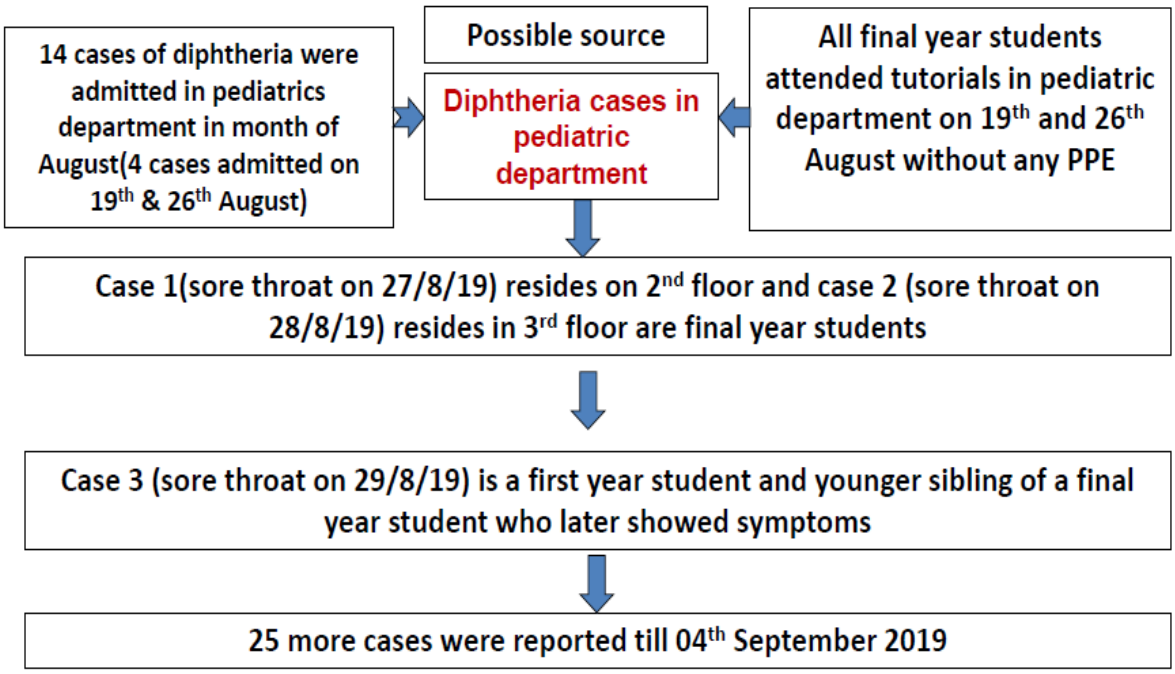
ISSN 2515-8260 Volume 09, Issue 07, 2022

1) This was a laboratory confirmed outbreak of Diphtheria among medical undergraduates of GIMS most likely due to poor isolation and PPE practices in the wards.
2) Poor immunization of medical students against diphtheria, non-isolation of cases on first day of illness led to spread of the illness among the hostel inmates.
3) There has been shift of age group in the outbreak from pediatric to adult age group.
4) No complications of diphtheria were seen among the cases.

Discussion

Chain of transmission

Interviewed all the initial cases presented with symptoms to find out possible source of infection and to find out possible chain of transmission at GIMS.



One ward in ENT department was designated for management of cases in outbreak. All cases upon diagnosis (membrane appearance or culture positive) were put in ENT ward and treated with antibiotics and Anti Diphtheritic Serum. They were discharged after 3-5 days after administration of ADS.100% cases wore surgical mask during illness. Median number of days of illness on day of isolation was one day (ranging from 0 – 5 days). Mean number of days of isolation was 4 days. Advised quarantine in vacant rooms in fourth floor of hostel till 14 days, which was not followed strictly.

Following actions were taken by hospital and college administration for prompt management of cases and to limit the outbreak:

1) Initially students with similar symptoms were sent to hospital for treatment and screening. Later all students were screened in lab irrespective of symptoms
2) All students in both hostels of GIMS were informed to report immediately in case of presence of symptoms.
3) Posters were put up in hostels containing information on signs and symptoms of diphtheria, mode of spread, control and prevention methods and asked them to report immediately if there had any symptoms.
4) All students and support staff were given prophylactic antibiotic (erythromycin or azithromycin) from 30/08/19
5) Asymptomatic students and support staff were given prophylactic Td vaccine starting from 02/09/19
6) Teaching classes and ward postings were suspended for 15 days
7) After discharge from hospital, cases were told to stay in fourth floor of the hostel which has vacant rooms
8) All students were strictly advised to wear masks and to stay away from cases
9) After this outbreak, isolation ward was established near to Pediatrics ward
10) Patients are retained here up to 14 days from onset.

As there is increased incidence of diphtheria in adolescents and adults there is need to revise the UIP is urgent and has been discussed before[6]. Adult boosters at 10 years intervals are currently non-existent in the country and could be considered [7, 8]. Serological studies in many countries

have revealed that due to lack of adult vaccination and natural immunity a high proportion of adults become susceptible to diphtheria [9].

Diphtheria, in spite of being a vaccine preventable disease has infected 4071 cases and caused 104 deaths in India for the year 2014 [10]. Hence the health agencies and the Government will have to take maximum efforts to increase immunization coverage from present 50-60% to more than 90% and bring down the worst statistics of diphtheria [11].

WHO recommends adult vaccination with Td combination for unvaccinated individuals of 7 years and older which not implemented in India yet [12]. The adult vaccination in India has not been implemented yet although WHO recommends Td combination vaccination for unvaccinated individuals of 7 years of age and older [13].

WHO team from vizag visited dept of ENT, GIMS Kalaburagi and recommended for standard PPE practices during clinical postings and proper isolation of cases.

Conclusion

By studying and analyzing the outbreak and also reviewing the literature of diphtheria it has been seen that poor immunization of medical students against diphtheria indicates the need to review the efficacy of immunization program need for the DPT booster dose in adults, poor PPE practices in the ward while examining the cases has been the cause of acquiring the disease from a pediatric diphtheria case, this indicated the need for proper PPE practices by the medical students, non-isolation of cases on first day of illness led to spread of the illness among the hostel inmates, this shows the importance of isolation of cases to prevent the spread of the disease. By analyzing the outbreak, it shows that, the early detection, isolation and treatment of the cases with diphtheria antitoxin early in the disease process will lead to prevention of complications and mortality due to the disease.

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