



A RETROSPECTIVE STUDY OF DIPHTHERIA AND ITS COMPLICATIONS IN A TERTIARY CARE HOSPITAL,GGH, GUNTUR

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ABSTRACT

AIM AND OBJECTIVE: To study clinical presentation and complication in diphtheria in pediatric age-group. **MATERIALS AND METHODS:** Retrospectively 25 clinical diphtheria cases who got admitted to the isolation unit of Government General hospital from August 2021 to July 2022 were taken for this study. The epidemiological details, vaccination status, clinical profile, treatment given, and interventions done with outcome were studied. **RESULTS:** The common symptoms observed were throat pain seen in 20 cases (80%), fever seen in 18 cases (72%), dysphagia seen in 10 cases (40%), bull neck seen in 6 cases (24%), palpitations seen in 04 cases (16%), Nasal regurgitation in 02 (8%). Of the 25 patients, 5 (20%) patients had completed vaccination, 20 (80%) cases were either unimmunized or partially immunized as per their age. The complications observed were cardiac involvement evident through elevated serum transaminase and ECG changes seen in 06 cases (24%), neurological involvement seen in 04 cases (16%), renal failure seen in 02 cases (8%), Airway compromise 02 cases (8%). A total number of 8(32%) patients died with complications. **CONCLUSION:** Diphtheria incidence is relatively more in the age-group > 5 years. The common symptoms are throat pain followed by fever, dysphagia, and bull neck. Common complications observed are myocarditis associated with high mortality, palatal palsy, renal failure, and Airway compromise. An increase in vaccination coverage is an effective preventive measure to reduce the incidence of diphtheria.

KEYWORDS : Diphtheria, Complications, Clinical manifestations, Vaccination.

INTRODUCTION:

Diphtheria is an acute toxin-mediated infection caused by *Corynebacterium diphtheriae*, which is associated with skin and mucosal infection. The major virulence of the organism is its ability to produce a potent exotoxin, which inhibits protein synthesis and causes local tissue necrosis. Paralysis of the palate and hypopharynx is an early local effect of diphtheria toxin. Toxin absorption is also associated with systemic manifestations like acute tubular necrosis leading to AKI, thrombocytopenia, cardiomyopathy, and demyelination of nerves.¹ Diphtheria has a mortality rate of 5–10% among young children.² Recent diphtheria outbreaks among the younger age-group reflect inadequate vaccination coverage and have demonstrated the importance of sustaining high levels of coverage in childhood immunization programs.³⁻⁵

AIM AND OBJECTIVES

- To study clinical presentation and complications in diphtheria in age-group 0-12 yrs.
- To study the epidemiological variability and immunization status of affected children.
- To study the various complications and their incidence.
- To identify mortality and morbidity trends in diphtheria.

MATERIALS AND METHODS

- Study Setting: Government general Hospital, Guntur.
- Study Population: A retrospective observational study was done in Government general Hospital, Guntur children admitted to isolation units.
- Study Period: 1 year from year 2021 to 2022.
- Study Design: Retrospective cross-sectional analysis.

Sample Size: 25

Inclusion Criteria:

All children of age up to 12 years who fit into the WHO case definition of diphtheria which includes:

- Clinically compatible case—Children with an illness of the upper respiratory tract characterized by pharyngitis, tonsillitis, or laryngitis and adherent pseudomembrane of

pharynx, tonsils, larynx, and/or nose and lacks both a confirmatory laboratory test result and epidemiological linkage to a laboratory-confirmed case.

- Epidemiologically linked case—A suspected case that meets the definition and is linked epidemiologically to a laboratory-confirmed case.
- Laboratory-confirmed cases—which include organisms isolated by culture or microscopy with Albert's stain.

Exclusion Criteria

- All other cases which do not fit into above criteria were excluded from the study.

Statistical Measures And Results

- All the cases which were admitted during the study period and fit into WHO definition of diphtheria case were collected retrospectively from the medical record department. Data were collected regarding demographic details, treatment status, complications like airway obstructions, palatal palsy, and other systemic effects of a toxin like myocarditis, renal failure, thrombocytopenia, and neurological effects and were analyzed.

Age Distribution Of Study Group

Table 1

Age	No. of cases	percentage
<6yrs	9	36
>6yrs	16	64

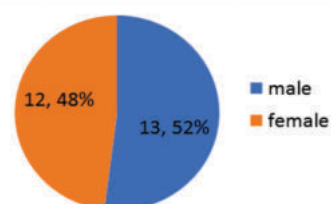


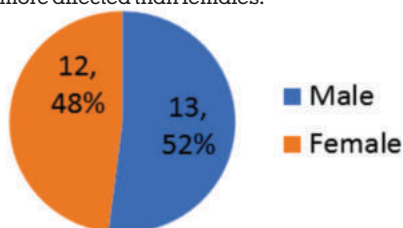
Figure 1

Most common age group involved are children > 6years (64%)

Sex Distribution Of Study Group**Table 2**

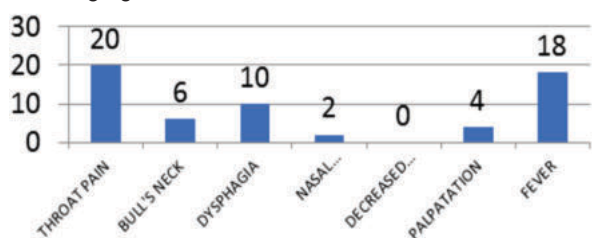
Sex	No. of cases	percentage
Male	13	52
Female	12	48

Males are more affected than females.

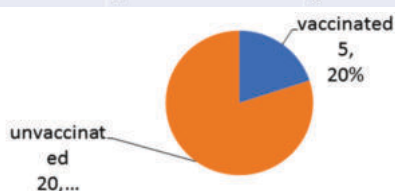
**Figure 2****Clinical Presentation To Er****Table 3**

FEVER	18(72%)
THROAT PAIN	20(80%)
BULL'S NECK	6(24%)
DYSPHAGIA	10(40%)
NASAL REGURGITATION	2(8%)
DECREASED URINE OUTPUT	0(0%)
PALPITATIONS	4(16%)

The above table shows the most common symptoms in children in our study which includes throat pain (80%), dysphagia (40%), bulls neck (24%), palpitations (16%) and nasal regurgitation (8%).

**Figure 3****Immunisation Status****Table 4**

Status	No. of cases	percentage
Vaccinated	5	20
Unvaccinated	20	80

**Figure 4**

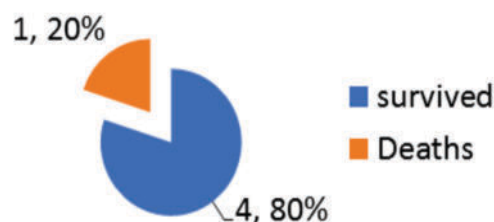
Among 25 cases in our study, only 5 cases (20%) were vaccinated while remaining were unvaccinated.

Outcome

E+A – Children treated with Erythromycin and Anti diphtheric serum

Table 5 : Children vaccinated

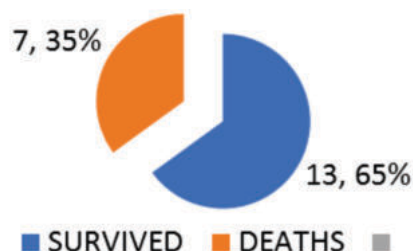
E+A	No of cases	percentage
SURVIVED	4	80
DEATHS	1	20

**Figure 5**

Among children who were vaccinated (5 cases), and treated with Erythromycin and ADS , 4 cases (80%) were survived.

Table 6: Children not vaccinated

E+A	No of cases	percentage
SURVIVED	13	65
DEATHS	7	35

**Figure 6**

Among children who are not vaccinated (20 cases), but treated with Erythromycin and ADS, 13 cases (65%) survived and 7 cases (35%) died.

Response To Anti Diphtheric Serum**Table 7**

DAY OF ADS GIVEN OF CLINICAL PRESENTATION	SURVIVED	DEATHS
WITHIN 5 DAYS	5(100%)	0(0%)
6-10 TH DAY	10(83.3%)	2(16.7%)
>10 DAYS	2(25%)	6(75%)

There was 100% survival rate in children who received ADS within 5 days of clinical presentation.

Common Complications**Table 8**

COMPLICATIONS	NO OF CASES
MYOCARDITIS	6
NEUROLOGICAL MANIFESTATIONS	4
RENAL FAILURE	2
AIRWAY COMPROMISE	2

The most common complication seen in children of our study group was Myocarditis.

Mortality Profile

Total Cases -8

Table 9

MYOCARDITIS	4(50%)
NEUROLOGICAL MANIFESTATION S	0(0%)
RENAL FAILURE	2(25%)
AIRWAY COMPROMISE	2(25%)

The most common complication leading to mortality is Myocarditis (50%)

RESULTS

- The common symptoms observed were throat pain seen in 20 cases (80%), fever seen in 18 cases (72%), dysphagia seen in 10 cases (40%), bull neck seen in 6 cases (24%), palpitations seen in 4 cases (16%), Nasal regurgitation in 2 (8%).
- Of the 25 patients, 5 (20%) patients had completed vaccination, 20 (80%) cases were either unimmunized or partially immunized as per their age.
- The complications observed were cardiac involvement seen in 06 cases (24%), neurological involvement seen in 4 cases (16%), renal failure seen in 2 cases (8%), Airway compromise in 2 cases (8%). A total number of 8(32%) patients died with complications.

DISCUSSION

- In our study population, 5 (20%) cases were immunized fully, 20 (80%) cases were not immunized or incompletely immunized. Minimum immunization coverage of 90% in children and 75% in adults is required to prevent the spread of diphtheria.⁶
- There is an age shift of occurrence of diphtheria noted recently and 45-50% were above the age of 6 years.^{7,8} This was initially noted in the Russian epidemic and China outbreak but for the first time in India similar observations were made in a study by Sharma.⁹ Similarly, in our study, >6years 16(64%) children were affected. This is similar to recent patterns observed in other studies which represent a shift in age-group. A decrease in the incidence of diphtheria with age shift explains increasing in the vaccination coverage rate but this is not completely achieved.
- The most common clinical features observed in our study were throat pain, fever, dysphagia, and bull neck. In a study conducted by Meshram and Patil, similar patterns of clinical features were observed, where the most common feature is throat pain followed by bull neck and respiratory difficulty.¹⁰ Common features in diphtheria are mostly due to local effects of the toxin.
- There were 9 deaths with a case fatality rate of 27% in Hyderabad. The case fatality rate in the Basavaraja study from Karnataka study¹¹ was 41% whereas it ranged from 32 to 56.3% in different centers in north India, and 42.9% in west India.¹² In our study 8 deaths with case fatality rate of 32%.

CONCLUSION

Diphtheria is a highly infectious disease and associated with high mortality which can be potentially prevented through proper vaccination. The incidence is relatively more in the

age-group >5 years. The common symptoms are throat pain followed by fever, dysphagia, and bull neck. Common complications observed are myocarditis associated with high mortality, palatal palsy, renal failure, and Airway compromise. An increase in vaccination coverage is an effective preventive measure to reduce the incidence of diphtheria.

Disclosure & Conflict of Interest

There are no conflicts of interest

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