



ORIGINAL ARTICLE

Tetanus; a dreadful complication of ear piercing, ear instrumentation and chronic otorrhea in children of Southern Punjab Pakistan.

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ABSTRACT... Objective: Tetanus remains a major public health problem in the developing countries despite the availability of active immunization and passive immunization since long. Non-sterile ear piercing and instrumentation pose a constant threat of developing tetanus associated with morbidity and mortality. **Study Design:** Retrospective Cross-sectional study. **Setting:** Department of Pediatric, Bahawal Victoria Hospital Bahawalpur. **Period:** June 2019 to June 2022. **Material & Methods:** The data of children admitted with tetanus following ear piercing, ear cleaning/instrumentation and chronic ear discharge was collected. The data included their age, gender, history of ear piercing, instrumentation and chronic ear discharge (otorrhea), duration between piercing/instrumentation and development of signs & symptoms of tetanus, history of tetanus vaccination (during routine childhood EPI vaccination), history of tetanus toxoid administration after the causative event, residence, socioeconomic status, education status of parents and outcome of cases. **Results:** Total 17 cases of otogenic tetanus (tetanus following ear piercing, ear instrumentation and with chronic otorrhea) were admitted in pediatric department of the hospital during study period. Age range was between 03 to 13 years with mean age 7.71+2.80 years. Of these cases, there were 12 females (70.6%) and 5 males (29.4%). Nine cases developed tetanus after ear piercing, five cases developed tetanus following ear instrumentation and three cases had history of chronic ear discharge. **Conclusion:** Tetanus is an uncommon but dreadful complication of non-sterile ear piercing, ear instrumentation and chronic discharging ears in chronic otitis media, and is still occurring in our country.

Key words: Chronic Otitis Media, Ear Piercing, Ear Instrumentation, Immunization, Otorrhea, Quacks, Tetanus, Tetanus Vaccination.

INTRODUCTION

Tetanus is a potentially lethal disease caused by toxins produced by *Clostridium tetani*, which is an anaerobic bacterium commonly found in soil.¹ The toxin attacks/binds to nervous system and blocks inhibitory signals resulting in muscular rigidity, stiffness and spasms. Spasm of masseter muscle causes “lockjaw” that is a unique feature of this disease. Other manifestations include dysphagia, opisthotonus, spasms of respiratory and laryngeal muscles.² Tetanus immunization is part of routine childhood immunization which has rendered it rare. However developing countries still face the challenge of poor childhood vaccination and uptake by the population. These challenges include poor awareness, hesitation, lack of

access, social and religious taboos etc. Owing to these reasons, it is not unusual to face vaccine preventable diseases in developing countries.^{3,4} Tetanus leads to 80,000 to one million deaths per year and 80% of these deaths occur in South East Asia and Africa.⁵ Tetanus has been reported after deep penetrating wounds, postpartum, non-sterile intramuscular and intravenous injections, ear piercing, ear instrumentation, chronic ear infections, acupuncture, tattooing, toothpicks, etc.^{5,6}

Ear piercing is a common cultural practice and tradition in our country. Females like to get their ears pierced for wearing ornaments.

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People get their children pierced at early age for this purpose. Ideally, ear piercing should be performed under aseptic conditions by experts only. But, in our society many quacks perform piercing procedures of people without taking necessary precautions especially aseptic measures. Secondly, quacks do not know the relative contraindications like infected ears, boils etc which can lead to catastrophic complications. Unhygienic ear piercing not only predisposes to various dreadful complications including perichondritis, chondritis, sepsis, cavernous sinus thrombosis but also tetanus.^{7,8}

Impacted cerumen and chronic otitis media are common causes of hearing impairment in children.^{9,10} In our setup, many people take children to quacks for ear cleansing / instrumentation for common otorhinological conditions including impacted cerumen and chronic otitis media.¹¹ Unfortunately, quacks are primary source of initial treatment of these otogenic conditions in developing countries like ours. As already emphasized, unhygienic conditions and unsterilized instruments can cause various complications including tetanus.⁷ Tetanus has been seen in chronic discharging ears where *Clostridium* microorganisms are thought to secondarily infect after contamination with dirty fingers, objects inserted into ears and ear cleansing/instrumentation.^{5,6}

The study has been carried out to study the pediatric cases of tetanus developing after unhygienic ear piercing and cleaning/instrumentation.

MATERIAL & METHODS

The retrospective study was carried out at pediatric department of Bahawal Victoria Hospital Bahawalpur. The hospital admission papers and records were checked thoroughly to acquire the data of children admitted with tetanus following ear piercing and ear cleaning/instrumentation in pediatric department of the hospital from June 2019 to June 2022 after approval from Ethical Review Board (1793/DME/QAMC) prior to commencing the study and consent was sought from all the participants for publishing their

data after contacting them through their contact numbers provided in hospital record.

Inclusion Criteria

1. Pediatric cases (<15 years) who were admitted in pediatric department with signs and symptoms of tetanus following ear piercing, cleansing/instrumentation and chronic ear discharge i.e otorrhea

Exclusion Criteria

1. Adult cases or cases with suspected strychnine poisoning and rabies were excluded

Hospital admission papers and records were scrutinized thoroughly and data was obtained. The data included their age, gender, history of ear piercing, instrumentation and chronic ear discharge (otorrhea), duration between piercing/instrumentation and development of signs and symptoms of tetanus, history of tetanus vaccination (during routine childhood EPI vaccination), history of tetanus toxoid administration after the causative event, residence, socioeconomic status, education status of parents and outcome of cases. Socioeconomic status was categorized into poor, lower middle class, upper middle class and high class/rich. Education status was categorized into illiterate (who had no formal education), primary qualified, matric qualified and graduates. The data was entered and analyzed with help of Statistical Package for Social Sciences (SPSS) 21. Frequencies were expressed in percentages.

RESULTS

Total 17 cases of otogenic tetanus (tetanus following ear piercing, ear instrumentation and with chronic otorrhea) were admitted in pediatric department of the hospital from January 2019 to June 2022. Age range was between 03 to 13 years with mean age 7.71+2.80 years. Of these cases, there were 12 females (70.6%) and 5 males (29.4%). Among them, all the cases of ear piercing were females. Nine (09) cases developed tetanus after ear piercing, five (05) cases developed tetanus following ear instrumentation and three (03) cases had history of chronic ear discharge. Mean duration between piercing and

instrumentation and appearance of symptoms was 10.64+4.18 days. However, mean duration of chronic ear discharge (otorrhea) was 135+39.69 days as shown in Table-I below. Mortality was 29.4%. There was no history of tetanus vaccination (tetanus toxoid administration) after the procedures performed. Majority of cases (88.2%) hailed from the rural areas.

S/No	Characteristic		N (18) (%)
1	Age		Mean age 7.71+2.80 years
2	Gender	Male	5 (29.4%)
		Female	12 (70.6%)
3	Cause of tetanus	Ear piercing	9 (52.9%)
		Ear instrumentation	5 (29.4%)
		Chronic Otorrhea	3 (17.6%)
4	Mean duration between piercing & instrumentation and symptoms of tetanus		10.64+4.18 days (N=14)
5	Duration of chronic otorrhea and symptoms of tetanus		135+ 39.69 days (N=03)
6	History of Vaccination of Tetanus (Tetanus toxoid) after the procedure	Yes	0 (0%)
		No	17 (100%)
7	Tetanus vaccination in EPI schedule	Yes	2 (11.8%)
		No	8 (47.1%)
		Don't remember	7 (41.2%)
8	Outcome	Alive	12 (70.6%)
		Death	5 (29.4%)
9	Residence	Urban	2 (11.8%)
		Rural	15 (88.2%)
10	Socio-economic Status	Poor	13 (76.5%)
		Lower Middle Class	4 (23.5%)
		Upper middle & High Class	0 (0%)
11	Education Status Father	Uneducated	13 (76.5%)
		Primary	3 (23.5%)
		Matric	1 (5.9%)
	Education Status mother	Uneducated	15 (88.2%)
		Primary	2 (11.8%)

Table-I. Clinical & demographic characteristics of tetanus cases

DISCUSSION

In our study, 17 children developed tetanus following ear piercing, instrumentation and chronic otorrhea. Of these, 09 cases developed after ear piercing, 05 were the result of ear non-sterile instrumentation and 03 had chronic ear discharge (otorrhea). All the cases of ear piercing were females as it's a cultural practice of females in our society and they had piercing from quacks. Eight cases developed tetanus following ear instrumentation/cleaning from local quacks. Mortality was 29.4% and 70.6% survived after successful treatment. Majority of cases belong to rural areas (88.2%) where quackery is a common practice.¹¹

Cases of tetanus following ear and body piercing keep on surfacing time to time in developing countries. Mumtaz H et al. reported a case of tetanus in a 6 year old girl following ear piercing.⁷ She expired after 02 days of admission in a hospital of Rawalpindi, Pakistan. Similarly, Ranga N et al. reported a case of fatal complication after umbilical piercing in a person who was found dead at his home, post mortem revealed the cause of death being post piercing complications.⁸ Adeel M et al. reported a case of otogenic tetanus in a 12 year old girl who presented with trismus for one week and otorrhea for 3 months. After showing no improvement on intravenous antibiotics, she was given tetanus toxoid and immunoglobulins considering the clinical suspicion of tetanus.¹²

Successful immunization of masses has eradicated this menace almost completely in developed world. Developing and under-developed countries are still facing the threat of this otogenic tetanus. During the previous century, otogenic tetanus was a frequent finding and had a high mortality. Mahoney JL reported 67 cases of otogenic tetanus in Zaire in 1975-1976. Mortality was 17% among these cases.¹³ DeSouza CE et al. reported 22 cases of otogenic tetanus in 1992.⁶ Similarly, Fischer GW et al. reported 08 cases of tetanus following chronic ear discharge in 1977, all of them survived with prompt and specific treatment.¹⁴ Such large number of cases are rarely reported in present era, however few cases are being reported as mentioned above.

Occurrence of tetanus following ear piercing, instrumentation and chronic ear infections is an alarming threat in our country during twenty first century. Use of non-sterile instruments and tools for piercing and instrumentation by quacks are the source of contamination such cases. In chronic otorrhea, fingering and inserting contaminated objects into ears are postulated mechanisms of spreading *Clostridium tetani* to the affected individuals.^{5,6,7,12} Poor tetanus vaccination / immunization of population during childhood render these children vulnerable to develop tetanus following piercing, instrumentation and chronic ear infection. This destitute state of tetanus vaccination/immunization is attributed to lack of awareness, illiteracy, decreased uptake by people, false beliefs, religious refusals, fears of injections/syringes, side effects, etc.^{3,4}

Clinicians should advise tetanus toxoids to all the patients of chronic otitis media with discharging ears and those who present to them with any complication of either ear piercing or instrumentation to reduce the chances of developing tetanus. Government must take actions to curb quackery practices so that people take to physicians for their otologic conditions. Educating masses regarding safe ear piercing and syringing/instrumentations at hands of physicians along with maximum coverage and uptake of routine childhood immunization is the key to eradicate this dreadful menace. Awareness of people can be enhanced through social media campaigns and role of local influencers to achieve maximum immunization.¹⁵

CONCLUSION

Tetanus is an uncommon but dreadful complication of non-sterile ear piercing, ear instrumentation and chronic discharging ears in chronic otitis media, and is still occurring in our country. Education people, enhancing awareness, curbing quackery, and maximizing coverage and uptake of routine immunization are the viable solution and need of the hour.





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AUTHORSHIP AND CONTRIBUTION DECLARATION

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4	Sagheer Ahmad	Data analysis, Editing.	
5	Abdul Rehman	Review, Editing.	