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## Declining Trend in Tetanus Hospitalizations

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Tetanus, especially neonatal is one of the important causes of morbidity and mortality in many developing countries. In contrast, the incidence and mortality of tetanus has become negligible in developed countries

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like USA and UK. Concerted efforts have been made in India to contain tetanus through EPI and then UIP, in which thrust has also been given to antenatal immunization(1). In recent years, we gained an impression of reduction in tetanus related hospitalizations which prompted the current report.

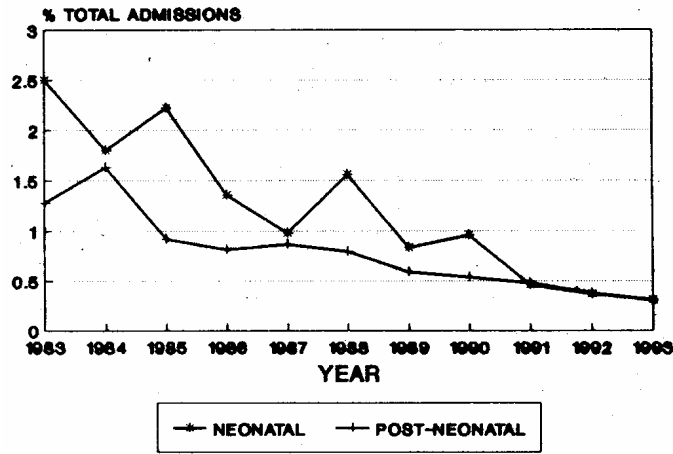
### Material and Methods

The yearly admissions of tetanus, both neonatal and post-neonatal, in the last 11 years from 1983 to 1993 as well as the total pediatric admissions in the corresponding years in the Pediatric Department of LNJP Hospital were found out from the hospital records. The contribution of tetanus to Pediatric hospitalizations was worked out by expressing the tetanus admissions as a percentage of the total pediatric admissions. Statistical analysis was done by using linear regression method with time as an explanatory variable.

### Results

The yearly pediatric admissions, the tetanus admissions and contribution of

tetanus to Pediatric hospitalization (*Fig. 1*) during 1983 to 1993 are shown in *Table 1*. There was a significant increase in the total pediatric admissions but a significant de-



*Fig. 1. Time trend in tetanus hospitalizations.*

**TABLE I - Time Trend of Total Pediatric and Tetanus Admissions**

Year	Total pediatric admissions	Neonatal tetanus		Post-neonatal tetanus	
		No.	%	No.	%
1983	12024	306	2.5	154	1.28
1984	10024	181	1.80	164	1.63
1985	12181	271	2.22	113	0.92
1986	12532	171	1.36	103	0.82
1987	12643	125	0.98	110	0.87
1989	14401	226	1.6	116	0.80
1989	12588	106	0.84	7	0.59
1990	13715	132	0.96	75	0.54
1991	13674	63	0.46	67	0.48
1992	14505	54	0.37	56	0.38
1993	13480	42	0.31	42	0.31
Time trend R <sup>2</sup>	0.572	0.763	0.865	0.896	0.837
b co-efficient	0.756	-0.873	-0.930	-0.947	-0.915
p value	0.007	0.000	0.000	0.000	0.000

\* Refers to the percentage of total pediatric admissions.

cline in the absolute number of neonatal and post neonatal tetanus cases and their contribution to hospitalization.

### Discussion

The tetanus cases in LNJP Hospital usually come from Delhi and the bordering states of Uttar Pradesh, Haryana and Rajasthan. The reduction in tetanus admissions in this hospital is a reflection of a decrease in tetanus cases in these areas. Referral bias is unlikely to be a cause as we have not observed a similar situation in case of other serious infections. A similar decline in neonatal tetanus has been documented in Madras(2).

Maternal immunization and safe delivery practices are the two key interventions for control of neonatal tetanus. Reduction of neonatal tetanus in the present study could be a reflection of improvement in both or any one of these factors. In this context, over the last decade an improvement in the both aspects has been appreciated, albeit more so for immunization coverage. The present study design, however, can not categorically address this issue.

The reduction in post neonatal tetanus appears solely to be due to improved immunization coverage as the other predisposing factors in its causation like trauma, ear

prickings, circumcision and chronic ear infections have apparently remained unchanged over the years. Trauma in children, the most important association of post neonatal tetanus, on the other hand appears to be on the rise(3,4).

It is concluded that hospitalizations due to tetanus are on the decline in Delhi and this is an indirect reflection of a reduction of tetanus cases in the draining areas. However, the decline needs to be accelerated by pursuing immunization strategies and safe delivery practices vigorously.

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