Clinical Features and Adverse Prognostic Indicators in *Datura* Poisoning in Children

We describe the clinical features and adverse prognostic indicators of *Datura* intoxication in 47 children. 15 (31.9%) children required intensive care and 1 (2.1%) died. Time elapsed >3.15 hour between ingestion and starting treatment [RR (95% CI): 9.4 (3.1-28.3)], age <9.5 year [RR (95% CI): 3.5 (1.5-8.0)], and seizure [RR (95% CI): 2.8 (1.4-5.8)] were the most important adverse prognostic features.

Keywords: *Atropine, Anticholinergic, Physostigmine, Toxidrome.*

Datura stramonium, an annual herb found universally in India, and is a frequently encountered cause of plant poisoning in children [1]. All the parts of the plant are toxic, particularly the fruits and seeds [2]. Intoxication results in anticholinergic symptoms and signs, due to presence of alkaloids (predominantly atropine, hyoscyamine, and scopolamine) [3]. Majority of available literatures is descriptive in nature, and focuses primarily in the Western population [4,5]. Hence, this study was conducted to identify the clinical features and adverse prognostic indicators of *Datura* intoxication in Indian children and adolescents.

This observational study was conducted in the Pediatric ward of a tertiary care center of West Bengal between 1 January, 2016 and 31 December, 2021, after taking approval from the Institutional ethics committee. Informed consents/assents were obtained from parent/ legal guardians/participants prior to enrolment. Datura poisoning was confirmed by identification of plant parts (by doctors/nurses/relatives), suggestive clinical features and, pilocarpine test [2]. A pre-designed, pre-tested schedule was used for data collection. Age- and sex-specific charts were used for identifying tachycardia and hypertension. Treatment included gastric lavage, supportive measures, physostigmine, and sedatives (diazepam). Paediatric intensive care unit (PICU) admission was decided by on-duty residents, guided by PRISM III score [6]. Blood investigations were performed if fever persisted for more than 12 hours, and according to clinical indications.

Shapiro-Wilk test was used to check nature of distribution. Chi-square test and Student *t*-test were used for checking statistical significance of difference between proportions and means, respectively. Relative risk (RR) for PICU admission was calculated. For continuous variables, cut-off values were calculated from the Receiver Operator Characteristic curve with the help of Youden's index. Binary logistic regression analysis was used to identify contribution of individual factors. P<0.05 was taken as statistically significant. SPSS version 19.0 was used for data analysis.

Forty-nine children were admitted with datura poisoning during the study period; data for two children were not available (1-refused consent, 1-left against medical advice). Of the 47 children [57.4% boys, mean (SD) age 12.0 year (4.0)], majority were Hindu (31, 66%), Bengali (45, 95.7%), belonged to lower socioeconomic status (26, 55.3%) and from rural area (43, 91.5%). Accidental poisoning was most common (30, 63.8%), followed by suicidal (16, 34%). All cases (47, 100%) were admitted following acute datura ingestion. Fifteen children (31.9%) required PICU admission, and one child (2.1%) could not be saved. Clinical features are presented in **Table I,** and the factors associated with PICU are summarised in **Table II**. Time elapsed between ingestion of *Datura* and starting treatment (>3.15 hour) [RR (95% CI): 9.4 (3.1-28.3); *P*=0.0001], age <9.5 year [RR (95% CI): 3.5 (1.5-8.0); *P*= 0.003] and seizure [RR (95% CI): 2.8 (1.4-5.8); *P*=0.004] were the independent risk factors of PICU admission following datura ingestion. Our model could correctly predict 56.9%-79.7% variance of independent variables, out of which 47.3%-66.2% variance was due to 'time elapsed between ingestion of *Datura* and starting treatment' alone.

In this study, the need for PICU admission and mortality were higher than previous reports [7,8] probably due to variability in amount of consumed datura and variable age distribution. Poisoning was mainly accidental, contrary to western countries (intentional), probably due to difference in culture, and under-reporting. Homicidal poisoning, though reported both in India and abroad [2,9], was not documented in this study. Clinical features of datura intoxication were similar to previous observations [2,4,5,7-9]. However, unlike previous report, neither rhabdomyolysis nor acute liver failure was noted in the current study [2]. Minute variations could be due to variation of species of *Datura* in different geographic areas, and intra-species and inter-species variation of alkaloid concentration [3]. Higher time elapsed before starting treatment and seizure, were important adverse prognostic indicators, probably both lead to higher concentration of atropine in central nervous system. Better systemic absorption of alkaloids might predispose younger children to more toxicity [10].

Table I Clinical Features of Datura Ingestion Among Children (*N*=47)

Clinical feature	*No (%)*
Mydriasis	46 (97.9)
Tachycardia	42 (89.4)
Delirium	39 (83.0)
Dry mouth	37 (78.7)
Fever	34 (72.3)
Behavioral abnormalities	24 (51.1)
Urinary retention	23 (48.9)
Hypertension	18 (38.3)
Seizure	7 (14.9)

Table II Factors Associated With Need for Pediatric Intensive Care Unit (PICU) Care.

Variables	*PICU required (n=15)*	*PICU not required (n=32)*
Age (y) [a,b]	9.4 (4.0)	13.3 (3.3)
Male sex	8 (53.3)	19 (59.4)
Lower socioeconomic status	8 (53.3)	18 (56.2)
Time since ingestion (h)[a,b]	4.2 (1.3)	2.2 (0.7)
Mydriasis	15 (100)	31 (96.9)
Tachycardia	13 (86.7)	29 (90.6)
Delirium	13 (86.7)	26 (81.3)
Dry mouth	12 (80.0)	25 (78.1)
Fever	11 (73.3)	23 (71.9)
Behavioral abnormalities	10 (66.7)	14 (43.8)
Urinary retention	8 (53.3)	15 (46.9)
Hypertension	5 (33.3)	13 (40.6)
Seizure [c]	5 (33.3)	2 (6.2)

Values in no. (%) or [a]mean (SD). *[b]P<0.001; [c]P<0.05.*

Chemical analysis of seeds could not be performed and serum level of alkaloids could not be estimated, and some information was solely based on self-report. To conclude, age of patients, and time elapsed between ingestion of *Datura* and starting treatment were two important factors associated with outcome of Datura ingestion in children. Further research in this under-reported entity is warranted for more generalizable data.

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