Changes in Pediatric Major Trauma – Epidemiology, Injury patterns, And outcome during COVID-19–associated lockdown

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Background: The COVID-19 pandemic and its associated preventive measures such as national and regional lockdowns have dramatically changed the epidemiology of pediatric admissions to the emergency department. Nevertheless, there are scant data on the epidemiology and injury patterns of major pediatric trauma injuries during these lockdown periods.

Methods: A single-center retrospective study of data obtained from a tertiary level 1 trauma hospital trauma registry. The data included demographics, injury mechanisms, injury severity and type, treatment, and resource utilization in children aged 0–18 years who required trauma team activation upon arrival. The analysis compares the data from the 5-week lockdown period from March to May 2020 in Jerusalem, Israel, to its parallel periods in 2018–2019.

Table 1. Demographics of injured children requiring TTA

	-2018 2019	%	2020	%	p value
Total presentations	139	100%	48	100.0%	
Age- average years (SD)	6.7 (8.1)	-	7 (5.1)		0.45
Gender- male	101	72.7%	38	79.2%	0.41
Female	38	27.3%	10	20.8%	
Discharge from ED	65	46.8%	19	39.6%	0.19
Admission to the hospital	74	53.2%	29	60.0%	0.21
PICU admission	24	17.3%	12	25.0%	0.47
Operations	24	17.3%	12	25.0%	0.36
Mortality	2	1.4%	1	2.1%	0.86
ISS average (SD)	8.8 (5.4)	-	7.5 (8.1)		0.47
ISS>15	21	15.1%	7	14.6%	0.88

PICU- Pediatric Intensive Care Unit, ISS- Injury Severity Score

Table 2. Type of injury of children requiring TTA

	2018- 2019	%	2020	%	p value
Fall	49	35.3%	16	33.3%	0.8
MVA	65	46.8%	6	12.5%	$p < 0.0001$
Burns	9	6.5%	10	20.8%	$p < 0.01$
Bicycle-related injury	7	5.0%	10	20.8%	0.001
Hit by heavy object	4	2.9%	3	6.3%	0.29
Other	5	3.6%	3	6.3%	0.43

MVA: motor vehicle accident. Other: refers to injuries such as heat stroke, drowning, gunshot wounds, stabbing and caustic ingestion

Table 3. Anatomical site if injury in children requiring TTA.

	2018-2019	%	2020	%	p value
Head and neck	78	56.1%	33	68.8%	0.12
Limbs	37	26.6%	10	20.8	0.43
Abdomen and chst	23	16.5%	8	16.7%	0.97
Multitrauma	14	10.1%	5	10.4%	0.95
Other	2	1.4%	3	6.3	0.07
TTA cancellation	12	8.6%	0	0	0.03

TTA: trauma team activation, Other; refers to injuries such as heat stroke, drowning, gunshot wounds, stabbing, and caustic ingestion

Results: A total of 187 trauma visits that required trauma team activation (TTA) were analyzed: 48 visits during the lockdown period vs. 139 in 2018–2019, corresponding to a 40% drop in TTA. There was a significant decrease of 34% in MVA-related injuries ($p = 0.0001$) but a significant increase of 14% in burns ($p = 0.01$) and a 16% increase in bicycle-related injuries ($p = 0.001$). No changes in ISS, injury patterns, admission rate, PICU utilization, or need for interventions were observed.

Conclusion: There was a significant decrease in the number of overall pediatric trauma visits during the 2020 lockdown, mainly in MVA-associated trauma, but an increase in burns and bicycle injuries. These findings can thus inform policy makers as to the need to formulate prevention awareness programs alerting the public to indoor hazards and the dangers of outside activities. Furthermore, the fact that PICU admissions and the need for operating rooms stayed unchanged, suggests that it is vital to maintain trauma team capabilities even during lockdowns