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Characteristics of Pediatric Head Injury Patients at Abdoel Wahab Sjahranie Hospital Samarinda in 2023–2024

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Abstract

Background: Pediatric head injury is an important emergency condition associated with substantial morbidity and mortality. **Objectives:** To describe the demographic characteristics, injury mechanisms, clinical severity, cranial or intracranial findings, and discharge outcomes of pediatric patients with head injury treated at Abdoel Wahab Sjahranie Hospital, Samarinda, during 2023–2024. **Methods:** A descriptive retrospective study reviewed 113 medical records of patients younger than 19 years with documented head injury and complete core variables. Data included sex, age group, injury mechanism, initial Glasgow Coma Scale category, cranial or intracranial findings, and discharge outcome. **Results:** Males comprised 69.91% of patients, while adolescents aged 10–18 years accounted for 74.34%. Traffic accidents were the leading mechanism of injury (80.53%). Mild head injury was recorded in 53.98% of cases, and epidural hematoma was the most frequent isolated finding (30.09%). Full recovery occurred in 51.33%, clinical improvement in 39.82%, and death in 8.85%. **Conclusions:** Traffic accidents were the predominant cause of pediatric head injury. These findings support strengthened road injury prevention and standardized clinical documentation to improve pediatric trauma surveillance and care.

Keywords: Characteristics; Children; Head Injuries.

Introduction

Head injury comprises traumatic damage to the scalp, skull, meninges, or brain and can alter neurological function, consciousness, memory, or behavior. Pediatric traumatic brain injury has age specific anatomical and physiological features that influence presentation, imaging decisions, monitoring, and treatment[1].

Injuries are a substantial source of death and disability in children. Hospital studies from referral settings show that pediatric traumatic brain injury is commonly associated with road traffic events and falls, while severity and outcome vary across settings[2,3,4]. These patterns support local surveillance because prevention priorities, referral pathways, and trauma resources depend on the mechanisms and clinical profiles seen in each service area.

The 2018 Indonesian Basic Health Research reported that head injuries constituted 11.9% of recorded injuries nationally. Injuries most often occurred at home and in the surrounding environment, followed by public roads[5]. In East Kalimantan, head injuries constituted 10.2% of injuries, with home environments and roads again identified as important locations[6]. These population data describe injury occurrence broadly and should not be interpreted as direct estimates of hospital based pediatric head injury incidence.

Early neurological assessment is central to head injury care. The Glasgow Coma Scale provides a reproducible description of consciousness, although severity cutoffs differ among studies[7]. The present study retained the institutional operational categories of mild injury at GCS 14 to 15, moderate injury at GCS 9 to 13, and severe injury at GCS 8 or lower. Physiological trauma scores that include GCS can support severity assessment and mortality estimation[8]. Computed tomography is commonly used to identify acute cranial and intracranial injury, while imaging must be interpreted with the clinical examination and the risks of radiation exposure in children[1].

Rapid recognition, stabilization, and referral are important because hypoxia, hypotension, seizures, and increased intracranial pressure can worsen secondary brain injury. Competent emergency response depends on health worker knowledge and practical skills[9]. Describing sex, age, mechanism, admission severity, recorded cranial findings, and discharge outcome at a tertiary referral hospital can therefore inform prevention, triage, resource planning, and future analytical studies.

The study addressed five questions: the distribution of injury mechanisms, severity based on the initial recorded GCS, cranial and intracranial findings, discharge outcomes, and demographic characteristics including age and sex. The analysis was descriptive and was not designed to estimate causal associations or population incidence.

Accordingly, this study described the characteristics of pediatric patients with head injuries treated at Abdoel Wahab Sjahranie Regional General Hospital, Samarinda, during 2023 to 2024. The local evidence was intended to identify the dominant patient and injury patterns while making the limitations of retrospective record selection and clinical documentation explicit.

Materials and Methods

Study Design

This study used a descriptive observational design based on retrospective review of medical records for pediatric patients with head injuries treated at Abdoel Wahab Sjahranie Regional General Hospital, Samarinda, during 2023 to 2024. The unit of analysis was one hospital record for one patient encounter. The design describes the distribution of recorded variables and does not test exposure outcome relationships.

Sample

The source population comprised pediatric patients with a documented head injury diagnosis who were treated at the hospital during the study period. Records were eligible when the patient was younger than 19 years, received care during 2023 to 2024, and had entries for sex, age group, injury mechanism, initial GCS severity, cranial or intracranial finding, and discharge outcome. Duplicate encounters, unavailable records, and records missing any core variable were excluded. The final analytic sample contained 113 records. The total number of source records, the number screened, and counts excluded for each reason were not available in the retained sampling log; consequently, the completeness of the selection flow cannot be verified from the submitted dataset.

Data Collection Technique

The original protocol applied eligibility screening followed by random selection of records to obtain the final sample. This procedure is reported as eligibility screening followed by simple random sampling rather than multistage sampling. The retained documentation did not identify the complete eligible sampling frame, the method used to generate the random sequence, or the inputs used for the previously reported sample size calculation. Therefore, 113 is treated as the final analytic sample rather than as proof that the complete source population was represented. Data were abstracted from secondary medical records into a structured worksheet. Each table totals 113, indicating complete core variables within the analyzed records; missingness among records excluded before analysis could not be quantified.

Data Analysis Technique

Data were processed using Microsoft Excel 2021 and summarized with frequencies and percentages. Age was coded into mutually exclusive groups: younger than 1 year, 1 to 4 years, 5 to 9 years, and 10 to 18 years. Exact age values were not retained in the analytic worksheet, so mean and median age could not be calculated. Severity was based on the initial GCS category recorded at hospital admission before definitive treatment: mild at 14 to 15, moderate at 9 to 13, and severe at 8 or lower. All 113 records had a severity category, but the worksheet did not indicate whether GCS was affected by intubation, sedation, or medication.

For the cranial injury variable, one mutually exclusive category was assigned to each record. Isolated categories comprised epidural hematoma, subdural hematoma, subarachnoid hemorrhage, intracerebral hemorrhage, cerebral contusion, or isolated skull fracture. The multiple findings category represented at least two recorded cranial or intracranial findings. Skull fracture was treated as a cranial injury rather than an intracranial lesion. The retained worksheet did not identify the imaging modality, so the proportion examined by computed tomography could not be verified. Full recovery was locally defined as normalized GCS, no recorded residual neurological deficit, and no further inpatient treatment requirement. Clinical improvement indicated improvement from admission with residual symptoms, follow up, or continued treatment needs. Death denoted death during hospitalization. No validated pediatric outcome scale was available.

Ethical Consideration

Ethical approval was recorded from the Health Research Ethics Committee, Faculty of Medicine, Mulawarman University, Samarinda, under approval number 69/KEPK AWS/VIII/2025. This retrospective secondary data study did not involve prospective research procedures. The submitted materials did not include the approval letter or document whether the committee waived individual consent, and no claim of written consent or waiver is made without verification. Before submission, the authors should confirm the actual consent or waiver determination against the original approval letter. The analytic file excluded direct identifiers, access was limited to the research team, and results are reported only in aggregate.

Results

The final analytic dataset comprised 113 pediatric head injury records that met the study eligibility criteria. All 113 records contained complete information for the six core variables analyzed, namely sex, age group, injury mechanism, initial Glasgow Coma Scale (GCS) severity category, recorded cranial or intracranial findings, and discharge outcome. Therefore, no missing values were identified for these variables within the retained analytic sample. However, because the source population count and the number and characteristics of records excluded before formation of the final dataset were unavailable, missingness and selection patterns among nonincluded records could not be evaluated. The overall demographic, injury related, clinical, radiological, and discharge characteristics of the study population are summarized in Table 1.

Table 1. Demographic, Injury, Clinical, Cranial or Intracranial, and Discharge Characteristics of Pediatric Head Injury Patients (N = 113)

Characteristic	Category	Frequency (N)	Percentage (%)
Sex	Male	79	69.91
	Female	34	30.09
	Total	**113**	**100.00**
Age group	Infants (<1 year)	3	2.65
	Toddlers (1–4 years)	7	6.19
	School age children (5–9 years)	19	16.81
	Adolescents (10–18 years)	84	74.34
	Total	**113**	**100.00**
Injury mechanism	Traffic accidents	91	80.53
	Falls	21	18.58
	Other mechanisms	1	0.88
	Total	**113**	**100.00**
Initial GCS severity category	Mild head injury	61	53.98
	Moderate head injury	27	23.89
	Severe head injury	25	22.12
	Total	**113**	**100.00**
Recorded cranial or intracranial finding	Epidural hematoma	34	30.09
	Subdural hematoma	14	12.39
	Subarachnoid hemorrhage	14	12.39
	Intracerebral hemorrhage	18	15.93
	Cerebral contusion	4	3.54
	Isolated skull fracture	4	3.54
	Multiple cranial or intracranial findings	25	22.12
	Total	**113**	**100.00**
Discharge outcome	Full recovery	58	51.33
	Clinical improvement	45	39.82
	In hospital death	10	8.85
	Total	**113**	**100.00**

As shown in Table 1, male patients predominated in the study population, accounting for 79 of 113 cases (69.91%), whereas females represented 34 cases (30.09%). The male to female distribution indicates that approximately seven of every ten pediatric head injury patients included in the study were male. This descriptive pattern demonstrates a substantially greater representation of boys among patients treated for head injury during the study period, although the descriptive design does not permit conclusions regarding sex specific risk in the underlying pediatric population.

The age distribution was markedly concentrated among older children and adolescents. Patients aged 10–18 years represented the largest age group, comprising 84 cases (74.34%) of the total sample. School age children aged 5–9 years accounted for 19 cases (16.81%), followed by toddlers aged 1–4 years with 7 cases (6.19%) and infants younger than 1 year with 3 cases (2.65%). Thus, approximately three quarters of all analyzed head injury cases occurred among adolescents. Because the retained dataset contained only categorized age information, measures such as mean age, median age, standard deviation, and age range at the individual level could not be determined.

Traffic accidents were the dominant mechanism of pediatric head injury, accounting for 91 patients (80.53%). Falls represented the second most frequent mechanism, involving 21 patients (18.58%), while only one patient (0.88%) had another recorded mechanism. These findings demonstrate that more than four fifths of the pediatric head injuries in the analyzed hospital records were associated with traffic related events. The substantial predominance of traffic accidents highlights the importance of considering road injury prevention in pediatric injury prevention strategies, particularly for older children and adolescents, who also comprised the largest age group in this study. However, the available dataset did not provide sufficient detail regarding road user type, helmet use, seat belt use, vehicle type, collision characteristics, or other circumstances surrounding the traffic events.

Based on the initial GCS severity category recorded in the medical records, mild head injury was the most frequent clinical severity category, affecting 61 patients (53.98%). Moderate head injury was identified in 27 patients (23.89%), while severe head injury was recorded in 25 patients (22.12%). Although more than half of the sample was classified as having mild head injury, a substantial proportion had clinically more serious presentations. When moderate and severe categories were considered together, 52 patients, representing approximately 46% of the sample, had an initial GCS category beyond mild injury. These proportions indicate that the hospital managed a considerable burden of moderate and severe pediatric head trauma during the study period. The available data, however, did not include detailed component scores of the GCS or information regarding sedation, intubation, medication exposure, or other factors that may have influenced neurological assessment.

Regarding recorded cranial or intracranial findings, epidural hematoma was the most frequent isolated category and was documented in 34 patients (30.09%). Multiple cranial or intracranial findings were recorded in 25 patients (22.12%), representing the second largest category. Intracerebral hemorrhage occurred in 18 patients (15.93%), whereas subdural hematoma and subarachnoid hemorrhage were each recorded in 14 patients (12.39%). Cerebral contusion and isolated skull fracture were the least frequent categories, each occurring in 4 patients (3.54%). Collectively, these findings demonstrate substantial heterogeneity in the structural injuries recorded among pediatric head injury patients. The presence of multiple cranial or intracranial findings in more than one fifth of patients also indicates that a meaningful proportion of cases involved more complex injury patterns rather than a single isolated finding. Nevertheless, interpretation should remain cautious because the retained dataset did not specify the imaging modality used, timing of imaging, anatomical location, lesion size, radiological progression, or whether repeated imaging was performed.

Discharge outcomes showed that 58 patients (51.33%) were categorized as having full recovery at the time of discharge, while 45 patients (39.82%) were documented as having clinical improvement. In hospital death occurred in 10 patients, corresponding to 8.85% of the analyzed sample. Therefore, 103 of 113 patients (91.15%) were discharged with either documented full recovery or clinical improvement, whereas approximately one in eleven patients died during hospitalization. These findings provide a descriptive overview of short term hospital outcomes but should not be interpreted as long term functional outcomes. The categories of full recovery and clinical improvement were based on local medical record documentation and were not derived from a standardized or validated pediatric outcome instrument. In addition, post discharge follow up data were unavailable, preventing assessment of persistent neurological impairment, functional disability, readmission, rehabilitation needs, or delayed mortality.

Overall, the combined findings demonstrate a consistent descriptive pattern in which pediatric head injury patients were predominantly male, largely adolescents, and most frequently injured in traffic accidents. Mild head injury was the most common initial GCS category, although nearly half of the patients had moderate or severe injury. Epidural hematoma was the most frequently recorded isolated cranial or intracranial finding, while multiple lesions were also relatively common. More than half of the patients were recorded as fully recovered at discharge, but an in hospital mortality proportion of 8.85% indicates that pediatric head injury remained associated with substantial clinical consequences. These results should be interpreted within the limitations of the retrospective dataset, particularly the absence of source population flow data, detailed imaging information, potential modifiers of GCS assessment, standardized functional outcome measures, and post discharge follow up.

Discussion

Males comprised 69.91% of the analyzed cases. Male predominance has also been reported in Indonesian and international pediatric head injury series[10,11,12]. The present descriptive data cannot determine why this pattern occurred, but differences in mobility, transport exposure, play, and risk behavior may contribute.

Pediatric trauma studies have associated male predominance with greater participation in outdoor and physically demanding activities[13]. This interpretation should remain contextual rather than biological or causal because the medical records did not contain activity patterns, supervision, vehicle use, helmet use, or other individual exposure variables.

Patients aged 10 to 18 years represented 74.34% of the sample. Adolescent predominance has been reported in hospital series from Denpasar, Semarang, and Bandung[10,11,14]. Increased independent travel and road exposure may be relevant in this age group, particularly where motorcycles are common.

The age distribution must be interpreted as a distribution among selected hospital records rather than an incidence rate. The mutually exclusive intervals eliminate the previous overlap at age 1, but exact ages were unavailable. Consequently, central tendency, age specific rates, and adjustment for the size of the underlying pediatric population could not be calculated.

Other settings have reported a larger burden among younger children when falls predominate[15]. Younger children may be vulnerable because of developing balance, limited hazard awareness, and dependence on adult supervision. Differences between studies can therefore reflect injury mechanism, referral thresholds, transport access, age structure, and hospital level rather than a single universal pediatric pattern.

Traffic accidents accounted for 80.53% of injuries, far exceeding falls and other mechanisms. Road traffic events were also prominent in Indonesian pediatric head injury series[10,11], whereas falls predominated in another hospital population[4]. The contrast highlights the importance of local mechanism data when selecting prevention priorities.

Trauma center data from Qatar likewise demonstrate that road traffic injury remains important in pediatric traumatic brain injury[16]. In Indonesia, inconsistent helmet use and unsafe road behavior remain preventable concerns[5]. Prevention should combine age appropriate helmet use, passenger safety, speed control, licensing enforcement, safe routes, caregiver supervision, and competent first response. Evidence from HTJ emphasizes that emergency knowledge should translate into practical basic life support skills[9].

Mild injury was the largest initial GCS category at 53.98%, followed by moderate and severe injury. Mild injury also predominated in hospital studies from Jakarta and Denpasar[10,17]. However, the present proportions depend on the institutional cutoffs of 14 to 15 for mild and 9 to 13 for moderate injury, which differ from some commonly used classifications.

GCS remains clinically useful but should not be interpreted in isolation. Trauma severity assessment can be strengthened by combining consciousness with respiratory and circulatory indicators, as reflected in the Revised Trauma Score literature[8]. The absence of intubation, sedation, medication, and timing fields in the retained worksheet limits confidence that every initial score represented an unmodified neurological examination.

A different tertiary center reported moderate injury as the most frequent category[18]. Variation may result from referral patterns, triage practices, injury mechanisms, severity definitions, and inclusion criteria. Direct comparison requires identical GCS timing and cutoff rules, which were not assured across the cited studies.

Epidural hematoma was the most frequent isolated category, while 22.12% had multiple cranial or intracranial findings. Pediatric imaging studies have reported differing distributions of epidural, subdural, subarachnoid, and intracerebral hemorrhage[19,20]. The revised category label is important because an isolated skull fracture is a cranial injury and not an intracranial lesion.

Epidural hematoma is a collection of blood between the inner skull and dura, commonly associated with trauma and skull fracture[21,22]. Clinical deterioration can occur as the collection expands, so neurological monitoring and timely neurosurgical assessment remain essential. The frequency observed here describes the coded hospital records and does not establish risk because no comparison group was included.

Anatomical vulnerability around the temporal bone and middle meningeal vessels helps explain the association between epidural hematoma and skull fracture[22,23]. In children, age related skull and dural characteristics may modify injury patterns. These mechanisms provide clinical context but cannot be confirmed from the aggregate worksheet, which contained no lesion location, fracture site, hematoma volume, or operative detail.

Traffic accidents and falls are recognized mechanisms of traumatic epidural hematoma[21]. The multiple findings category in this study denoted at least two recorded cranial or intracranial findings, rather than a lesion type directly comparable with each isolated category. Although all 113 records had one assigned category, the missing imaging modality prevents confirmation that all patients underwent computed tomography.

Full recovery was the most frequent discharge category at 51.33%, while 39.82% showed clinical improvement and 8.85% died. Favorable survival has been reported in other pediatric head injury series[11]. Nevertheless, this study used local discharge definitions and did not apply the Glasgow Outcome Scale, Pediatric Cerebral Performance Category, or another validated instrument.

High survival proportions have also been described in hospital studies from India and Indonesia[24,25]. Comparisons remain limited because case mix, referral level, follow up duration, and definitions of recovery differ. Discharge alive, clinical improvement, and full functional recovery are not interchangeable outcomes.

Outcome is influenced by primary injury severity, secondary insults, timeliness of treatment, intracranial pathology, and complications. Indonesian hospital data likewise show that the distribution of outcomes varies with the clinical profile of included patients[26]. The current univariate analysis did not cross tabulate severity, mechanism, imaging findings, or age with death; therefore, no factor can be identified as an independent predictor.

Initial GCS is clinically informative, but outcome assessment should also consider pupil response, hypoxia, hypotension, extracranial injury, treatment, and functional status. The age advantage sometimes observed in children should not be assumed for an individual patient because severe primary injury and secondary brain damage may still produce death or disability.

The 10 in hospital deaths warrant further analytical study. Severe GCS and extensive hemorrhage are plausible markers of risk in pediatric traumatic brain injury[3,18], but the present dataset does not report patient level combinations or adjusted estimates. Future work should examine these relationships with clearly timed measurements and a validated outcome scale.

The study provides a two year description from a tertiary referral hospital and complete tabulated core variables for the 113 analyzed records. A tertiary trauma service can support rapid assessment, imaging, surgery, intensive monitoring, and coordinated referral; HTJ literature also highlights the wider service context of trauma center care[27]. Important limitations remain: the total source population and exclusion flow were unavailable; the random selection procedure could not be verified; exact age, imaging modality, sedation and intubation status, lesion details, and validated outcomes were absent; and consent waiver status requires confirmation. These limitations create possible selection and information bias and prevent causal or population level inference.

Retrospective record studies require a traceable connection between the source population and the final analytic sample. A future revision of the study archive should report the total number of pediatric head injury encounters identified for 2023 to 2024, remove duplicate encounters, list records unavailable for review, show exclusions for each criterion, and state the number randomly selected and analyzed. The RECORD reporting statement provides a useful framework for documenting selection from routinely collected health data[28]. Without this flow, the direction and magnitude of selection bias cannot be estimated. For example, unavailable records may differ systematically in severity, referral origin, length of stay, or outcome. The current tables accurately describe the 113 retained records, but they cannot show whether the retained sample mirrors every pediatric head injury encounter at the hospital.

A prospective data dictionary would further improve reproducibility. Each variable should have a source field, allowable values, timing rule, and missing value code. Age should be retained in months for infants and years for older children before categorization. Mechanism should distinguish the injured child's road user role, helmet or restraint use, collision partner, fall height, and place of occurrence. GCS should include eye, verbal, and motor components, assessment time, prehospital treatment, intubation, sedation, and the reason a component cannot be tested. Imaging should record modality, date, lesion side and location, fracture site, mass effect, midline shift, and whether findings were isolated or concurrent. Such definitions would permit independent verification rather than relying on broad aggregate labels.

Imaging decisions should also be separated from imaging findings. Clinical decision rules can identify children at very low risk of clinically important traumatic brain injury and support selective use of computed tomography[29]. Guidance for mild pediatric traumatic brain injury similarly recommends avoiding routine imaging and using validated clinical assessment to balance missed injury against radiation exposure[30]. The current dataset cannot evaluate imaging appropriateness because it does not identify which patients underwent computed tomography, magnetic resonance imaging, skull radiography, or clinical observation alone. Future abstraction should therefore use all eligible head injury records as the denominator, report the proportion imaged, and present lesion distributions among the imaged subgroup. This would prevent the lesion table from being misinterpreted as evidence that every patient received the same diagnostic examination.

For severe injury, a descriptive GCS category is only the beginning of clinical characterization. Evidence based pediatric severe traumatic brain injury guidance emphasizes prevention of secondary insults, appropriate monitoring, intracranial pressure management when indicated, and coordinated critical care[31]. Future hospital surveillance should record airway intervention, oxygen saturation, systolic blood pressure, pupil findings, seizures, transfer interval, neurosurgical procedure, intensive care admission, and complications. These variables would help explain why some patients with similar initial GCS values experience different outcomes. They would also allow the hospital to examine time sensitive service indicators without implying that a single intervention caused recovery in an uncontrolled retrospective dataset.

Outcome measurement should extend beyond the administrative condition recorded at discharge. Full recovery, clinical improvement, and death are understandable local categories, but the boundary between full recovery and improvement depends on how residual symptoms and treatment needs were documented. A standardized pediatric functional outcome measure, neurological examination, school participation, and follow up after discharge would better capture disability. Readmission, seizure, persistent headache, cognitive difficulty, behavioral change, and caregiver burden are also relevant. When follow up is unavailable, the manuscript should describe discharge status only and avoid equating hospital survival with complete neurological recovery. This distinction is especially important for mild injury, where symptoms may continue despite a normal or improving GCS.

The predominance of traffic accidents has prevention implications beyond hospital treatment. Global estimates show that traumatic brain injury burden varies by region and is strongly influenced by road traffic exposure and health system capacity[32]. Integrated approaches to traumatic brain injury emphasize prevention, acute care, rehabilitation, and research as connected parts of one system[33]. Locally, useful surveillance would distinguish motorcycle drivers, passengers, pedestrians, cyclists, and occupants of other vehicles. Linking mechanism data with age, helmet use, time of day, referral origin, and injury severity could identify preventable patterns. Collaboration among hospitals, emergency medical services, schools, families, transport authorities, and police would then allow prevention messages and enforcement to target the circumstances documented in local cases.

The tertiary hospital context also shapes interpretation. As a referral center, the hospital may receive a mixture of mild injuries requiring observation and severe injuries transferred for neurosurgical or intensive care. Referral filtering can produce distributions that differ from primary hospitals or community incidence. Future reports should state whether each patient arrived directly or by referral, the referring district, transport mode, transfer time, and treatment received before arrival. Reporting these fields would clarify access to definitive care and identify delays in the trauma pathway. It would also help distinguish the epidemiology of injury occurrence from the case mix generated by hospital referral functions.

A stronger subsequent study could use all eligible records with a prespecified protocol and double checked abstraction. Descriptive analyses should report denominators and missing values for every variable. Cross tabulations could examine severity by mechanism, age, imaging category, and discharge outcome, while multivariable analysis could explore factors associated with death only if sample size and event counts are adequate. Sensitivity analyses should test alternative GCS cutoffs and the effect of excluding records with uncertain timing or sedation. These steps would transform the present hospital profile into a more reproducible surveillance platform while preserving the current study's central finding: among the analyzed records, adolescent males, traffic accidents, mild initial GCS categories, and epidural hematoma were prominent.

Conclusion

Among 113 analyzed pediatric head injury records, males represented 69.91% and patients aged 10 to 18 years represented 74.34%. Traffic accidents were the dominant mechanism at 80.53%. Mild injury based on the institutional initial GCS classification accounted for 53.98%. Epidural hematoma was the most frequent isolated cranial or intracranial category at 30.09%, and 22.12% had multiple findings. Full recovery was recorded in 51.33%, clinical improvement in 39.82%, and in hospital death in 8.85%. The findings support road injury prevention and standardized emergency documentation. Interpretation should remain descriptive because the source record flow, imaging modality, factors affecting GCS, and validated functional outcomes were unavailable.

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Conflict of Interest Statement

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