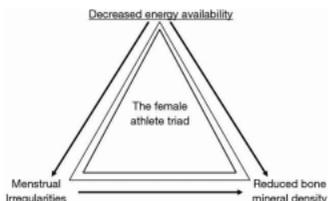


Background

- Abnormal menstrual patterns have been observed in women following a traumatic brain injury, which may be the result of disruption in the hypothalamic-pituitary-ovarian axis.¹
- Concussion during the luteal phase of cycle is associated with worse post-concussive outcomes when compared to concussion during the follicular phase.²
- Hormone control females experience less severe post concussion symptoms compared to non-hormone control females.³
- Menstrual irregularities during early reproductive years may decrease bone mineral density in females 20 years and younger.¹
- The incidence and clinical significance of menstrual irregularities (MI) in pediatric patients after concussion is not well understood.



Purpose

Determine the incidence and patterns of menstrual irregularities (MI) in pediatric patients after a concussion and whether this is associated with prolonged recovery time.

Hypothesis

- We hypothesized that:
- Menstrual irregularities following traumatic brain injuries will predict patient recovery time.

Methods

- A retrospective cohort chart review of 97 female pediatric (11-20 years of age) concussion patients (n=97).
- Questionnaire survey provided at each visit.
- The survey asked for number of years since first menses, hormonal contraceptive use, if any MI since the concussion, and type of MI.
- Data collected from 11/1/2018 to 5/30/2019.
- Patients with menarche less than 2 years and/or had experienced irregularities prior to the concussion were excluded from the study.
- MI patterns after concussion were reported as increased frequency of periods, longer and shorter duration of menstruation, or change in flow of menstruation.
- 26.8% of pediatric patients reported menstrual irregularities.
- 73.1% of pediatric patients with reported MI were in the 16-20 age group.
- Most common irregularities reported: a delayed cycle (38.5%) and/or a heavier flow (38.5%).
- Other self-reported irregularities included more painful dysmenorrhea, more frequent cycles in a short amount of time, or menstruation after prolonged period of amenorrhea due to hormonal contraceptive use.
- 84.6% of MI pediatric patients experienced prolonged post concussive symptoms (PPCS).

Results

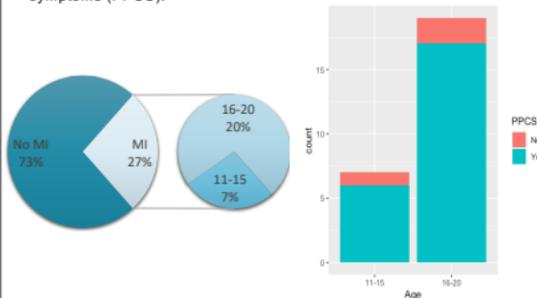


Figure 1: Displays the incidence of menstrual irregularities among pediatric patients and the distribution of MI by age group.

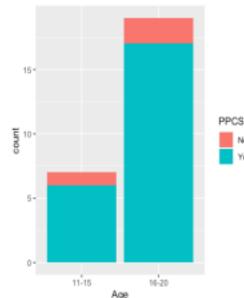


Figure 2: Displays the proportion of PPCS within pediatric patients with reported menstrual irregularities.

Average Days of Recovery for Recovered Pediatric Patients (p=0.825)

Patients with reported MI	Patients with no reported MI
142 days	133 days

Table 1 displays the comparison of the days of recovery for recovered patients with and without reported MIs.

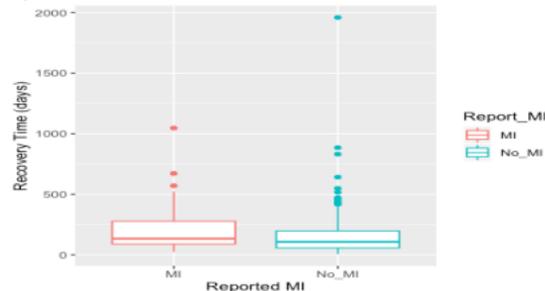


Figure 3: Displays the average days of recovery for patients with reported MI vs patients with no reported MI.

Conclusions

Menstrual irregularities are common after pediatric concussions and most common in the PPCS population with the highest rates in the older adolescent (16-20) age group. MI may be an important predictor of PPCS and should be reviewed by clinicians in the setting of head trauma. Recovery time after pediatric concussion was longer in the recovered menstrual irregularity group but was not statistically significant.

References

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- Wunderle K, Hoeger KM, Wasserman E, Bazarian JJ. Menstrual Phase as Predictor of Outcome After Mild Traumatic Brain Injury in Women. *J Head Trauma Rehabil*. 2017 January 15; 29(5): E1-E8.
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