Longitudinal Pediatric Post-traumatic Headache Treatment Outcomes

ConTex

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OBJECTIVES

- Headache is the most common symptom reported after concussion, and patients often use headache treatments like NSAIDs and triptans for symptom relief. However, the outcomes of NSAID use for post-traumatic headache (PTH) have not been clearly described.
- Treatment outcomes for PTH with commonly used medications and non-pharmacological interventions should be compared to better direct effective treatment of PTH.
- This study compares the treatment of headache without medications or with simple analgesic medications (NSAID/analgesic), triptans, or other headache medications on 3-month headache outcomes in children and adolescents following concussion.

METHODS

Participants

- 528 participants (239 female and 289 male) with no history of treatment for headache or migraine or reported routine use of NSAIDS prior to injury.
- Age 6-18 (M=13.92, SD= 2.54).
- Evaluated within 30 days of injury (M= 11.57 days, SD=8.34) at an outpatient concussion clinic participating in the North Texas Concussion Registry (ConTex).

Measures

- Subjects were grouped by medication use during recovery from a concussion.
- Subjects completed the Sport Concussion Assessment Tool-5 (SCAT-5) symptom evaluation at initial clinic visit and at three month follow-up.
- Headache symptom severity from SCAT-5 was recorded as 0(One) to 6(Severe).

Analysis

- Chi Square analysis and Fisher's Exact Test were used to determine if there was a significant relationship between medication use and headache frequency three months after initial clinic evaluation.
- ANOVA was used to determine if there was a significant difference in severity of headache symptoms between medication groups.

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TABLE 1. *Sample Characteristics*

Age in Years M(Median)	13.9(14.0)
% Female	45.3%
% Non-Hispanic	81.10%
% White	80.30%
Medication	
None Reported	N= 172(32.6%)
NSAID only	N= 323(61.0%)
NSAID and Triptans	N= 28(5.3%)
Triptans Only	N= 5(1.1%)

Figure 1. *Chi Square NSAID Use and Headache Frequency*

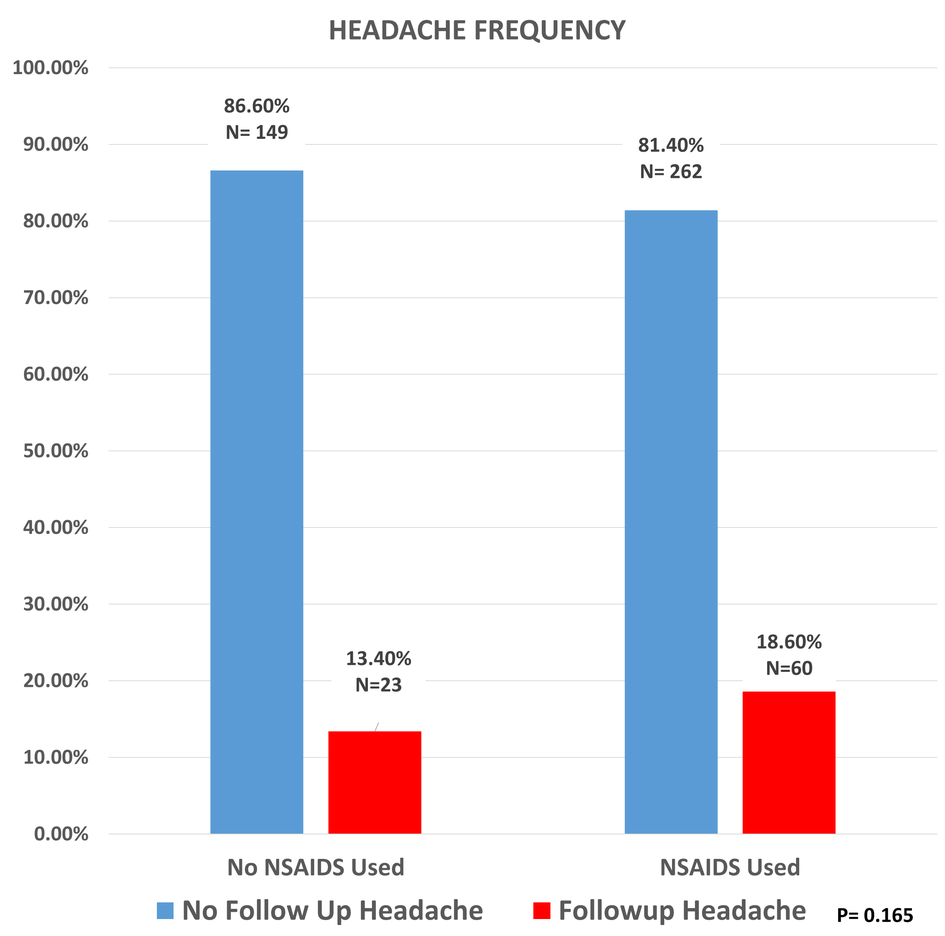
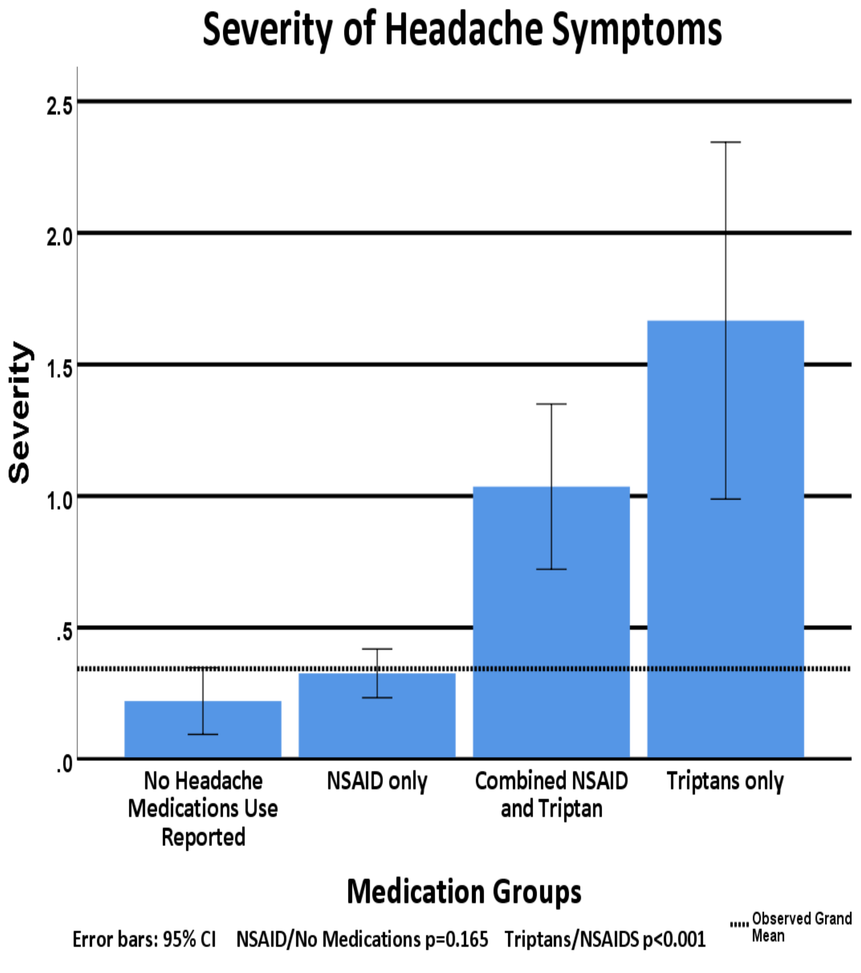


Figure 2. *Headache Symptoms*



RESULTS

- A majority (67.4%) of subjects (n=356) reported using NSAIDs/analgesics, triptans, or other medications for PTH following concussion.
- Regardless of treatment option, the number of subjects who reported headache symptoms decreased from 75.4% at initial post-injury visit to 18.6% at the 3-month follow-up surveys ($p<0.035$).
- Individuals with headache symptoms who used only NSAIDs for headache symptom relief(N= 398) did not show significant improvement in headache symptoms at 3 months than subjects who chose to not use medications ($p=0.165$). .
- 5 out of 5 subjects who only used triptans reported new or persisting headache symptoms at 3-months compared to 10 out of 28 of those using triptans in combination with NSAIDs or 23 out of 172 using only NSAIDs ($p<0.001$).

CONCLUSIONS

- In this population of pediatric subjects with acute concussion and headache, individuals who used headache medications, like NSAIDs, for post traumatic headache did not report a significant improvement in headache symptoms at 3 months versus those who did not use medication.
- Furthermore, although the number was small, subjects using only triptans reported new or persisting headache symptoms at 3-months.
- Further research that focuses on PTH phenotype, potential biomarkers, treatments, and outcomes is indicated.

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REFERENCES

1. Lucas et al. (2014). A prospective study of prevalence and characterization of headache following mild traumatic brain injury. Cephalalgia, 34(2): 93-102.
2. Bree & Levy. (2016). Development of CGRP-dependent pain and headache related behaviours in a rat model of concussion: Implications for mechanisms of post-traumatic headache. Cephalalgia.