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Predictors of Prolonged Recovery from Concussion

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Abstract

- Sport-related concussion has been thrust to the forefront of medicine in recent years.
- A high degree of variability in clinical presentation and length of recovery has made management of this condition difficult.
- This review examines whether pre-existing risk factors or sign and symptom based variables exist to reliably predict a patient's likelihood to experience a protracted recovery from concussion.
- The review of literature revealed heterogeneous results.
- This is due, in part, to the variability in the definition of prolonged recovery, ranging from seven to 90 days. Despite this variability, several factors emerged as having useful prognostic value.
- History of previous concussions is a factor that may put individuals at increased risk for prolonged recovery.
- The presenting symptoms of dizziness, migraine symptom cluster, and high symptom burden also provide an indication that a patient is up to 7.3 times (p=0.006) more likely to experience a protracted recovery (Kontos et al, 2013).
- Contrary to traditional assumptions, loss of consciousness is not predictive of prolonged recovery.
- Neurocognitive indicators show promise of having prognostic value but the application in primary care is currently impractical.
- While these factors do not provide means to definitively identify individuals who will suffer from protracted recovery, they do allow for the identification of those at increased risk. Such information can be useful in making timely referrals, effectively managing recovery expectations, and offering anticipatory guidance.
- Early identification of individuals at risk for protracted recovery can aid in the mobilization of additional support resources.

Introduction

- The medical community has been experiencing an evolution in concussion assessment and management.
- One of the difficulties with concussion management has been the high degree of variability in presentation and recovery.
- While it has been shown that most individuals will recover from their injuries within seven to ten days, there is a small but significant subset whose injuries will take longer to resolve.

Statement of the Problem

- It has been difficult to identify the subset of individuals in the acute and/or subacute phases of their injuries.
- This makes planning for return to school, work, or sports problematic.
- Mobilization of additional support services, referrals, or other therapies may be delayed.
- If these individuals can be identified early, realistic expectations for recovery can be set as well as timely referrals made to specialists or other ancillary support services.

Research Question

In patients who have sustained a concussion, do any pre-existing risk factors, signs, symptoms, or neurocognitive test results predict a prolonged recovery compared to those who do not exhibit the same factors?

Literature Review

- Adolescent athletes tend to recover slower than college age athletes, but age is not associated with prolonged recovery (Field et al., 2003).
- Recovery time in those with ADHD is not significantly longer than those without (Mautner et al., 2015).
- Eisenburg et al. (2013) found individuals who sustained a previous concussion within the last year had symptom duration 3 times longer than those without a concussion history or whose injuries were more remote.
- Corwin et al. (2014) found those who experienced dizziness at the time of injury were more likely to experience symptoms beyond 4 weeks (p=0.028) and took 2.6 times longer to recover than those who did not (p=0.032).
- Corwin et al. (2014) found symptom provocation with oculomotor exam was associated with symptom duration beyond 4 weeks (p=0.001).
- Kontos et al. (2013) found those who experience migraine symptom cluster were 2.6 times more likely to experience symptoms beyond 3 weeks than those with headache alone and 7.3 times more likely than those with no headache (p=0.04 and p=0.006 respectively).
- Meehan et al. (2014) found initial symptom scores on SCAT2 for those with symptoms lasting 4 weeks or more were significantly higher than those whose symptom duration was shorter.
- Lau et al. (2011) found significant changes between baseline and post-injury computerized neurocognitive test scores predicted prolonged recovery with 73% ppv.
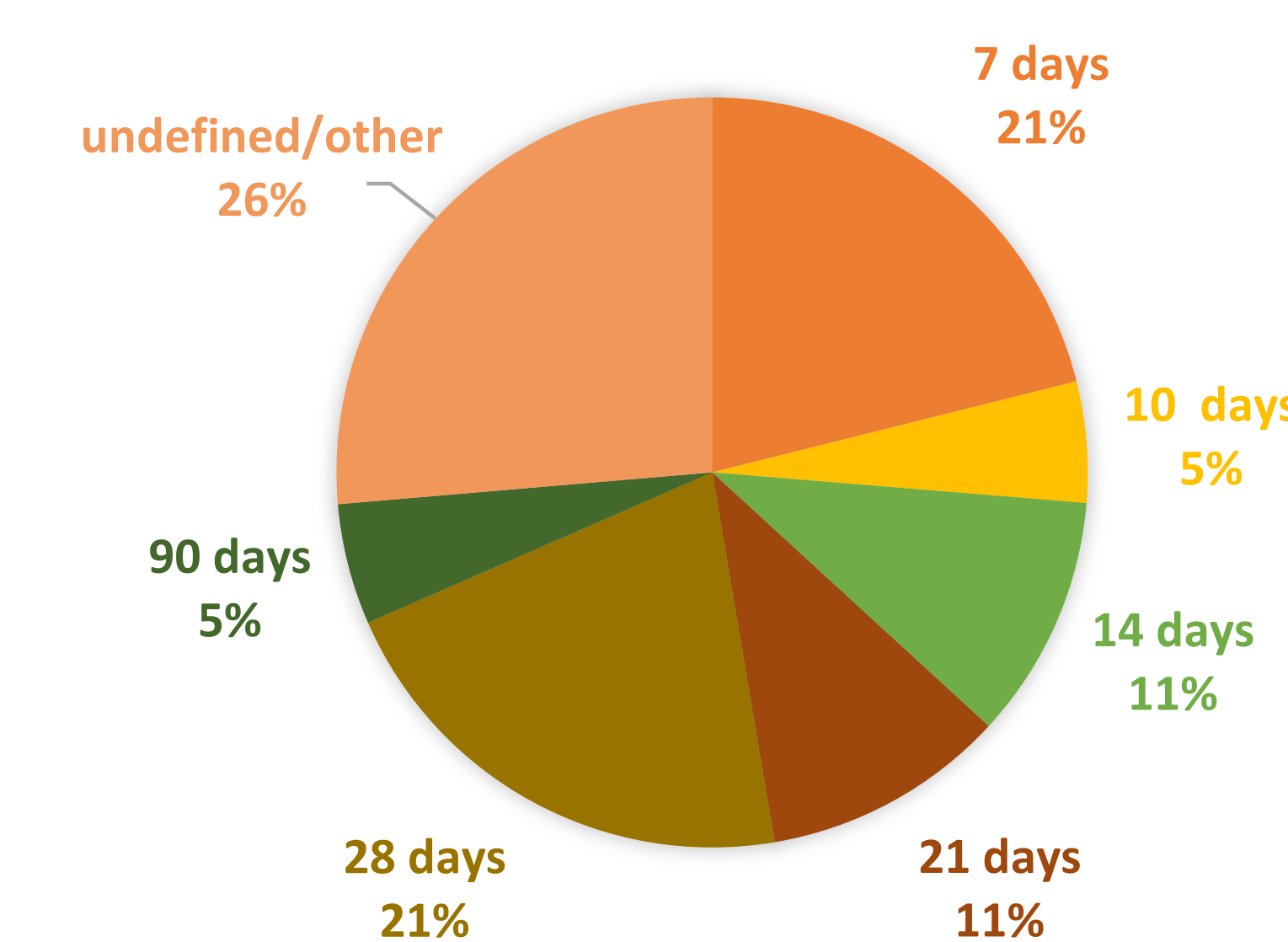
Discussion

- Variability in the definition of prolonged recovery has contributed to heterogeneous research outcomes.
- Individuals with a history of previous concussions, especially within the previous year, should be considered higher risk for prolonged recovery. However, this risk is not quantifiable.
- Loss of consciousness has poor prognostic value with regard to recovery time.
- Presence of dizziness at the time of injury, independent of other signs and symptoms, is associated with prolonged recovery.
- As total symptom score increases (as measured by instruments such as SCAT), the odds of prolonged recovery increase. However, the risk of any given individual has not been quantified and reliable break points on symptom inventories have not been established.
- As total number of symptoms increase, recovery time increases.
- Migraine symptom cluster (headache, nausea, sensitivity to light or sound) is associated with prolonged recovery.
- While computerized neurocognitive testing has shown promise in identifying individuals at high risk for delayed recovery, its application in the primary care setting is currently impractical. Additional research in this area is warranted to confirm its prognostic value.

Applicability to Clinical Practice

- The evidence available is inadequate to devise formal clinical guidelines for identifying individuals at high risk for prolonged recovery from concussion. However, research trends are sufficient to inform clinical decision making.
- Inquiring about the presence of dizziness, migraine symptom cluster, and assessment of overall symptom burden should be standard practice as these appear to have the strongest prognostic value.
- These findings should prompt a referral to a clinician experienced in the management of concussion.
- Such a referral is likely to mobilize additional treatment options and resources outside the primary care clinician's scope of expertise.

DEFINITION OF PROLONGED RECOVERY AS A PERCENTAGE OF STUDIES REVIEWED

- 7 days 21%
- 10 days 5%
- 14 days 11%
- 21 days 11%
- 28 days 21%
- 90 days 5%
- undefined/other 26%

https://s.yimg.com/viU7_8x2IHSchxpkthxr.jpg

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