# How Creatine Can Help with Concussion & Traumatic Brain Injury | Dr. Andrew Huberman

What can you take or do to reduce headache And in order to address this we're gonna start first with the headaches associated with head hits and traumatic brain injury because it turns out there's a surprising and very useful approach to doing that But this same approach also can help offset and treat headache in other conditions as well Meaning not just for headaches caused by traumatic brain injury but also headaches caused by sudden onset tension headache or migraine headache or even perhaps again perhaps cluster type headaches So the first substance that I'd like to highlight that has been shown to significantly reduce the intensity and or frequency of headaches is creatine Now creatine as many of you know is something that people supplement and take most often creatine is discussed in the context of muscle performance not just for people who weightlift but for people who do endurance exercise And it's often been said that 5 to 10 g per day of creatine monohydrate depending on how much you weigh 5 to 10 g per day of creatine monohydrate can increase creatine phosphate stores in muscles can bring more water into muscles can make you stronger can increase power output And that is all true That is all completely true We discussed this in the Heber Lab podcast with Doctor Andy Galpin when he was a guest on the uh Hebrew Lab podcast or Standard series And we discussed this extensively in an upcoming episode from Doctor Andy Galpin in his special six part guest series where he is a guest on the Hebrew and Lab podcast But where really he's the one doing the majority of the teaching That series covers everything from strength hypertrophy endurance And there's an episode on supplementation where we go deep into the discussion about creatine Now in that discussion and again now we highlight the fact that creatine while most often discussed online and in the media as a supplement for sports performance for the reasons I just mentioned actually has far more data behind it that is laboratory studies exploring the role of creatine in the clinical setting So I'd like to highlight a paper from that literature Now that will make very clear as to why creatine is interesting and in fact very effective for treating headache in particular headache caused by head hits or traumatic brain injury The title of the paper is prevention of traumatic headache dizziness and fatigue with creatine administration Now keep in mind this is a pilot study it was performed in humans So when you hear the

words preclinical that is if you hear there was a preclinical study on blank that means almost always that the study was performed on animal models mice rats primates et cetera A clinical trial is something that's carried out on humans And a pilot study means that the study was carried out on humans But on a fairly small cohort a very fairly small group uh or limited number of subjects Nonetheless if the data are robust as it is in this case of this paper I think it's worth paying attention to So in this study what they looked at was creatine administration So what they did is they had people ingest a certain amount of creatine I'll tell you in a moment in fluids So it could be taken in water or milk with or without food Doesn't really matter what time of day they had people take creatine why would they have people take creatine after traumatic brain injury and in particular for people that are suffering from headache dizziness fatigue et cetera The reason is that neurons nerve cells rely very heavily on the regulation of calcium in order to generate those action potentials to communicate with one another So it doesn't matter if it's a motor neuron a sensory neuron or a modulatory neuron they all generate action potentials or something similar to it And calcium is important for that process Calcium becomes dysregulated after traumatic brain injury in a number of different ways in particular in ways that impact the energy production systems of cells that are related to a TP adenosine triphosphate for those aficionados out there that want to look it up You can simply look up calcium A TP and neurons and you can learn about that cycle Creatine can be stored in muscles as we talked about before But creatine and in particular the phosphorated form of creatine which is the readily available fuel source form of creatine can also be stored in brain tissue and it is actually quite prominently stored in the forebrain The area where the real estate of of your brain just behind the forehead which is involved in planning and action and understanding context So it's very important for cognition It's important for personality too but it's important for a number of different aspects of life that have to do with making plans being able to focus very intensely on your work et cetera or on anything for that matter all functions that become heavily disrupted in people who have traumatic brain injury and concussion creatine ability to communicate with the calcium in the A TP system was the motivation behind this study that is the author's hypothesize on the basis of preclinical data in animals that by increasing creatine stores within the brain not just in the muscle but in particular within the brain that the availability of creatine would allow for better cognitive function in general Now they didn't look at cognition specifically in this paper but they did look at the other

aspects that is that the bad stuff associated with TB I and they had people supplement with creatine at a level that is much higher than the typical level that people supplement with creatine simply for sports performance So as I mentioned before most people if they supplement with Creatine for sports performance they take creatine monohydrate typically 5 g per day sometimes 10 g per day if they're about 100 kg or or greater in body weight 100 kg is 200 approximately £220 So the dosage that was used for su su implementing creatine in this study to address the potential impact of creatine on headache dizziness and fatigue was quite a bit higher than the dosages used simply for muscle performance In this study they had people take a dose of 0.4 g of creatine monohydrate per kilogram of body weight So for somebody that weighs 100 kg or £220 that would be 40 g of creatine per day If someone weighs half that much they would take 20 g of creatine per day And they did that over a period of six months And we know that when you take creatine over and over day to day that there's a build up of creatine stores both in the muscles and within the brain tissue Now what they found as a consequence of this creatine administration was really striking and I think quite exciting they found a very significant decrease in the frequency of headache in people that were supplementing with creatine as opposed to the controls Now keep in mind that this is a pilot study but the effects are very dramatic They found a very statistically significant decrease in the frequency of headache in people that were taking creatine In fact if you look at the controls and you see that they're basically getting headache at a frequency of 90% or more After TB I the reduction in headache frequency is down to about 10 or 12% in the people taking creatine So that's quite quite a dramatic effect And if you look at the other measures they took keep in mind again this is a pilot study So a limited number of subjects but again the results are very impressive What they found is that the number of people experiencing dizziness was significantly reduced in people supplementing with creatine As was the number of people experiencing fatigue kind of acute fatigue and chronic fatigue Again not chronic fatigue syndrome per se but chronic fatigue which was in this study defined as a general sense of bodily weakness and even mental weakness Mental weakness is a little bit hard to quantify But um they were very careful to distinguish between cognitive and mental fatigue versus physical and somatic fatigue Um They acknowledged that both of those occur in TB I or post TB I The headache is quite frequent Basically the takeaway of this study is that for people experiencing headache dizziness and fatigue due to TB I and perhaps and I want to underline

perhaps because it hasn't really been explored yet but perhaps headache dizziness and fatigue due to other conditions symptoms or causes of headache creatine monohydrate supplementation might be again might be an excellent candidate for people to try Why do we say that Well first of all creatine monohydrate is relatively inexpensive It's considered safe at the dosages used in this study And uh certainly for sports performance as well And there are very few other compounds that have been shown to have as significant an impact on headache over the long term as has creatine monohydrate in these studies of people with TB I it's also important to highlight the fact that many many people suffer from TB I si mentioned earlier And as now there are very few treatments for TB I you tend to get the basic advice coming back And I again I think it's excellent advice you know get proper amounts of sleep get exercise but don't get another traumatic brain injury That's obvious But you'd be surprised how many people go right back to work because they have to and you know we have to be sympathetic to the fact that many people just can't stop working or go on disability So many people have to go back to work that could be sport it could be other kind of work where they are then subject to perhaps getting more TB I maybe they're getting less rest as a consequence And stress obviously stress is a confounding issue for TB I But sleep exercise So nutrition all of those things proper social connection are what people are encouraged to do when they have TB I But there have been very few compounds in particular very few over the counter compounds that are known to be safe that have shown efficacy in dealing with TB I So I think that while this is a pi uh pilot study and uh we can consider it preliminary I think um it's important enough in the effects were dramatic enough that people with headache and in particular people with TB I ought to consider supplementing with creatine in order to deal with their headaches And of course I eagerly await other studies exploring the role of this high dosage of creatine which is a relatively high dosage of creatine monohydrate for offsetting headache Meanwhile I think there are a number of people out there suffering from headache um who might consider using creatine monohydrate in an exploratory fashion and seeing whether it helps offset their headaches Keep in mind of course any time you're gonna add or remove anything uh supplements or otherwise from your uh from your treatment your nutrition et cetera I do suggest that you consult with your physician in particular if you have chronic headaches I don't say that to protect me I say that of course to protect you