Pre-workout supplements: Why five of the six most common ingredients probably aren't helping you

February 3 2022, by Graeme Close, Andy Sparks

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When it comes to getting in shape, many people are willing to try any tricks they need to reach their goals faster. For many years, protein shakes were seen as essential after a workout. But more recently, in addition to protein shakes, many are also turning to pre-workout

supplements. These are marketed as being able to enhance your workout by increasing energy, boosting metabolism and improving muscle growth. They're usually taken as a tablet or consumed as a drink around 30–45 minutes before a workout.

But despite the high demand for pre-workout supplements, the lack of research, variations in the products, and uncertainty about what they contain makes it difficult for consumers to understand how effective they really are—and whether they do what they claim.

Here we take a look at some of the most common pre-workout ingredients to see whether there's any evidence they work.

Caffeine

Caffeine is typically added to most pre-workout supplements as a stimulant to reduce fatigue and increase alertness. There's good evidence showing that consuming caffeine around 30–60 minutes before exercise can improve endurance performance (such as running or cycling) typically by as much as 20% during exercise lasting one to two hours. It may also make your workout feel slightly less difficult.

The main downside of caffeine is that high doses (between 5–13 milligrams of caffeine per kilogram of body weight—so around 375mg–975mg for a 75kg person) have reported side-effects, such as an upset stomach, confusion and poor sleep. For perspective, a single espresso shot only contains about 75mg of caffeine. But smaller doses (around 3mg per kg of body weight) have still been shown to be effective with fewer or no side-effects. Most pre-workout supplements contain between 85mg–300mg of caffeine.

It might seem easier to simply drink coffee before exercise, but depending on where your coffee comes from, the caffeine content can

vary considerably. This may mean that you have either too much, or not enough, whereas a set dose from a supplement can be easily controlled.

Beta-alanine

Beta-alanine is an amino acid that your body naturally produces. It works together with other chemicals in the body to produce a substance called carnosine. Carnosine is stored in your muscles, and is an important factor in maintaining the pH level of the muscle—which can be important in delaying fatigue during high intensity exercise.

For this reason, beta-alanine is added to many pre-workout supplements to reduce fatigue. However, while there is some evidence that taking beta-alanine supplements can work, at least 3.6 grams would need to be taken daily for up to six weeks to have any effect—and most pre-workout supplements only contain around 350mg–3,200mg. There's no evidence that taking small amounts before a workout has any effect, apart from the tingling side effect that can occur in some people, which may make them think it's working.

Branched-chain amino acids

Branched-chain amino acids (also known as BCAAs) are another common ingredient. We usually obtain them from foods like dairy, meat and legumes, and they are added to pre-workout supplements to promote muscle growth and reduce fatigue.

Most pre-workouts contain around 400mg–1500mg of BCAAs. But at these levels, there's little evidence they're effective in promoting muscle growth or reducing fatigue. In fact, BCAAs typically need to be taken at much higher doses (around 5,000mg) after exercise to promote muscle growth and repair.

Creatine

Creatine monohydrate is a chemical found naturally in our body, as well as in foods such as red meat and seafood. Many pre-workout products contain creatine because it's thought to increase muscle size and strength.

While lots of research shows that creatine is beneficial for improving many aspects of performance—such as how many sprints you can do, muscle strength and how quickly you can recover after a workout—at least 3g–5g needs to be taken daily to be effective.

Evidence also shows that initially taking 20g of creatine for five days, followed by a maintenance dose of 3g–5g per day will improve athletic performance. However, taking small doses before exercise is not shown to have any benefit. Pre-exercise supplements contain around 1.5g–5g per serving—so if you take a large amount initially, they may have some effective thereafter.

Green tea

Green tea extract is usually added to pre-workouts in order to reduce body fat. Pre-workout supplements that contain green tea typically contain around 100mg–250mg.

There's limited evidence that green tea has any effect at such low doses. Results are also mixed even when looking at high doses (around 300mg–600mg) taken over a long period of time.

B vitamins

B vitamins are typically found in foods such as fish, chicken and dairy. Many pre-workout supplements contain B vitamins because they help us

produce energy, which can of course help us perform better during a workout.

But unless a person is deficient in these vitamins, it's unlikely that taking a product which contains them will have any benefit—although exercise may increase the need for some B vitamins, especially B2 and B6.

Most of the ingredients found in pre-workout supplements are shown to be safe at the low doses they're typically included in. However, taking them late in the day may be a bad idea, as the caffeine in them could disrupt sleep.

But of major concern are some of the novel ingredients included in some supplements as they often haven't been studied or tested as well as other ingredients. In some cases, they may even cause serious problems, such as liver damage. So checking with a registered sports nutritionist or dietician before taking a supplement is a good idea.

Despite pre-workout supplements being one of the fastest growing sports supplements, aside from caffeine there are not many ingredients that are consistently effective for improving athletic performance when taken in small doses before a workout.

Provided by The Conversation

Citation: Pre-workout supplements: Why five of the six most common ingredients probably

aren't helping you (2022, February 3) retrieved 8 July 2024 from https://medicalxpress.com/news/2022-02-pre-workout-supplements-common-ingredients.html