

Effects of caffeine on repeated freestyle sprints in elite male swimmers



Clinical Trial — CONSORT evaluation

Title and Abstract

CONSORT item 1a (Schulz, Altman, & Moher, 2010) identifies that, caffeine ingestion improves repeated freestyle sprints in elite male swimmers were non-randomised controlled trials (RCTs) (Goods, Landers and Fulton, 2017).

The Abstract complies with CONSORT item 1b. The structured summary of trial design is single-blinded and crossover study to verify the sufficiency of caffeine and placebo to improve repeated-sprint performance in exclusive freestyle sprinters. In terms of duration, the trial conducted for three weeks. Participants were allocated into treatment groups via simple randomisation in which warmup, experimental protocol, blood sampling and sprint times were included. This data is useful for EBPs when analysing the study. The results indicate that valuable improvement to sprint time was found of each sprint in the caffeine trial. It concluded that the combination of the moderate dose of caffeine with trained athletes is most likely to enhance repeated sprint ability. However, the ability of caffeine ingested to the athletes to improve performance remains unclear.

Introduction

CONSORT item 2a is about scientific background, which is described quite well in this article. Caffeine is a popular ergogenic aid among athletes to investigate its effects on swimming performance. A study found an improvement seen in free-style sprint performance of trained participants by using 250mg of caffeine. Nevertheless, due to lack of information about

caffeine ability to improve sprint or performance, it is difficult to determine the efficacy of moderate dose caffeine to improve free style performance.

In the current study it was hypothesised that adequate dose of caffeine would lead to beneficial improvement in the first and mean sprint all through the 6 x 75m repeated sprint trial which conforms to the CONSORT item 2b.

Methods

CONSORT item 3a somehow related to this study. This was a 3-week, single-blind, cross-over study of nine highly trained male swimmers to assess the improvement in 6 x 75m freestyle performance from caffeine ingestion in Australia.

According to CONSORT item 4a the eligible participants were all male highly trained swimmers aged 20.8 ± 2.8 y; body mass 83.9 ± 6.4 kg who met the eligibility criteria for the consent to participate and complete a pre-participation health history form approved.

The CONSORT item 5 is in the article. Firstly, participants were allocated into treatment groups before their first session through simple randomisation and then all participants completed standardised warm up before testing session. For each trail, sprints were started by researcher and simultaneously a waterproof heart rate bar was placed on participants' chest to check heart rates in each trial.

Item 6a partly found in this article. The primary outcomes with respect to efficacy of caffeine was the participants' performance improved after the ingestion of moderate dose of caffeine but the exact mechanism for an

improved repeated-sprint ability following proper caffeine ingestion remain unknown.

There are no changes seen to the trial outcomes after it commenced, which means item 6b is not clear in the article.

The CONSORT item 7a is partly answered in the article. There were nine highly trained swimmers selected for the trial. Moreover, it was stated that participants were enlisted, and characteristics were listed in the trial. Whereas, there is no information about how participants were chosen. EBPs should use a sample size to avoid bias and increase the chances of producing relevant data.

Participants were allocated into treatment groups prior to their first session via simple randomisation that is 1: 1 allocation that shows item 8b in the article.

Item 9 is in the article. Each week, substrate tablets were ground up and body weight corrected doses were deposited into white gelatine capsules. Participants consumed same number of capsules in trials.

Item 10 is not answered in the article as there is no information about who generated allocation sequence or who assigned participants.

The outcomes assessors, coaches and data analysts were kept blinded to the allocation in the trial which is CONSORT item 11a.

The CONSORT item 12a is described a hazard ratio which compares the probability of event in statistical analysis. The analysis found smallest

worthwhile change in performance was deemed to be standard deviation (SD) 0.2 among SD participants across all sprints in the placebo trial.

Item 12b about the methods for additional analysis like subgroup analyses and adjusted analysis. Nevertheless, in the trial there was no information about additional analysis.

Results

The article

has no

participant

flow

diagram.

Therefore,

it does not

conform

with

CONSORT

item 13. An

item 13a is

somewhat

met. The

number of

participants

were

randomly

assigned in
trial either
for caffeine
or placebo,
but it is not
clear in the
article.

However,
the trial
analysed
the primary
outcomes
of placebo
or caffeine
in
swimmers
in Table 1,
by giving
relevant
data for
each sprint,
placebo or
caffeine
and effect
size. The

given
information
demonstrat
es that
worthwhile
improveme
nt to sprint
time
occurred in
each
caffeine
trial.

CONSORT
item 14 is
not
mentioned
in the
article.

There was
no relevant
evidence in
the trial
about the
elimination
of

participants

and why

trial was

ended or

stopped.

There was

no table in

the article

showing

baseline

demograph

ic data and

clinical

characteris

tics of each

group.

That is

why, it

does not

adhere to

CONSORT

item 15.

CONSORT

item 16

somehow

met with
this article
as the
primary
analysis
was done
to improve
performanc
e and
involved all
participants
who were
randomly
assigned
but it was
not stated
whether all
participants
were
involved in
each trial
or not.

For item
17, there is
some

binary
outcomes
like the
moderate
caffeine
ingestion
improved
performanc
e by 1. 3%.
While there
was only a
large effect
for
improveme
nt seen for
3rd and 4
th sprint
that was 2.
5% and 2.
1%.
The harms
and
unintended
effects in
each group

of trial
meets the
requiremen
t of
CONSORT
item 19.
The article
stated that
heart rate
increased
throughout
the trial.
Five
participants
correctly
guessed
the order in
which they
ingested
each
substrate,
but three
participants
reported
that

caffeine
may have
affected
their sleep
that night,
with one
missing the
next
morning's
training
session.

Discussion

The article conforms to CONSORT item 20. It describes the pros and cons of the study and its results, imprecision and considering other relevant evidences. There was a lack of information on sources of bias for this trial. Another research limitation of this trial was an insufficient dose of caffeine. Imprecision of the trial was the moderate dose of caffeine ingestion which improved mean sprint time during 6 x 75m freestyle repeated sprint convention performed by best swimmers, nonetheless, just a substantial impact for development was recorded for the third and fourth sprint.

As the intervention is implemented for highly trained male swimmers, different age groups to improve performance, the results indicate that worthwhile improvement was found for each of the first 5 sprints of caffeine ingestion. Explicit mention of external validity is not given, even if that is

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what authors discussed in the article. So, CONSORT item 21 partly answered in the article.

Item 22 partly complied with article. There was no large effect seen in the athletes' performance in prior surveys but after 3rd and 4th sprint the performance improved by 1.3% following moderate dose of caffeine ingestion.

Full details of the trial protocol can be found with full text at www.jssm.org. This conforms CONSORT item 24.

Ethical approval for the trial was granted by Human Ethics Committee of the University of Western Australia and blood sampling equipment used in the trial from Radiometer Medical A/S, Copenhagen, Denmark. This describes item 25.

References

- Goods, P. S. R., Landers, G., & Fulton, S. (2017). Caffeine ingestion improves repeated freestyle sprints in elite male swimmers. *Journal of Sports Science and Medicine*. 16 (1), 93-98.
- Schulz, K. F., Altman, D. G., & Moher, D. for the CONSORT Group. (2010). CONSORT 2010 Statement: Updated guidelines for reporting parallel group randomised trials. *BMJ*, 340, c332. doi: 10.1136/bmj.c332