

INTISARI

Aktivitas fisik di lingkungan yang panas akan menyebabkan kenaikan temperatur inti tubuh. Selain itu tubuh juga kehilangan ion melalui keringat yang dikeluarkan. Pemberian minuman dengan temperatur rendah merupakan salah satu alternatif yang dapat mengurangi risiko tersebut. Salah satu jenis minuman yang diklaim sebagai *hydration fluid* terbaik adalah minuman isotonik. Namun, kini mulai muncul alternatif *hydration fluid* dari bahan alami yang berasal dari air kelapa muda. Penelitian ini bertujuan untuk mengetahui respon fisiologis dan subjektif terhadap pemberian asupan *ice slurry* dari minuman isotonik dan air kelapa muda ketika melakukan aktivitas fisik di lingkungan panas.

Sembilan orang laki-laki (usia: $22,1 \pm 0,9$ tahun; massa tubuh: $70,95 \pm 4,72$ kg; tinggi badan: $169,8 \pm 3,1$ cm) melakukan aktivitas fisik berlari di *treadmill* dengan kecepatan 65% HR_{max} selama 30 menit di ruang terkondisi dengan temperatur $36,6 \pm 0,8^{\circ}C$ dan kelembaban relatif 72 ± 6 %, dilanjutkan dengan *recovery* selama 30 menit. Subjek penelitian mengalami tiga perlakuan yaitu tanpa pemberian asupan cairan, pemberian *ice slurry* dari air kelapa muda, dan pemberian *ice slurry* dari minuman isotonik. Pemberian *ice slurry* sebanyak 7,5 gr/kg massa tubuh subjek penelitian dilakukan 30 menit sebelum melakukan aktivitas fisik. Variabel yang diukur adalah temperatur timpani, temperatur kulit, temperatur tubuh, *body heat storage*, denyut jantung, kenyamanan termal, sensasi termal, sensasi kehausan, *rate perceived exertion*, *nausea*, dan *drinking pleasure*. Uji statistik menggunakan uji *repeated measure* ANOVA dilanjutkan dengan uji *Post-Hoc* dengan *Bonferonni correction*.

Hasil penelitian menunjukkan dengan pemberian asupan *ice slurry* menunjukkan adanya perbedaan signifikan terhadap penurunan nilai temperatur timpani, temperatur tubuh, dan detak jantung dibandingkan keadaan tanpa pemberian minuman. Sementara itu, nilai temperatur kulit tidak menunjukkan adanya perbedaan yang signifikan. Hasil respon subjektif juga menunjukkan hasil perbedaan di variabel kenyamanan termal, sensasi kehausan, sensasi termal, dan *rate perceived exertion*. Tidak terdapat perbedaan signifikan pada respon fisiologis dan subjektif antara kedua jenis minuman. Akan tetapi, pemberian asupan *ice slurry* dari minuman air kelapa muda lebih dirasa nikmat dan diminati oleh subjek penelitian.

Kata kunci : *ice slurry*, air kelapa muda, minuman isotonik, respon fisiologis, respon subjektif

ABSTRACT

Physical activity in hot environment may cause an increase in core body temperature. Moreover, the body loses ion simultaneously through sweat. Ingesting cold beverage before physical activity (precooling) is one of counter measures in lowering core temperature and ion loses. Isotonic water is claimed as one of best alternatives hydration fluid. Nowadays, natural hydration fluid such as young coconut water become more popular. This study aimed at investigating the effect of ice slurry ingestion made of young coconut water or isotonic drink on physiological and subjective responses during physical activity in hot environment.

Nine male subjects (age: 22.1 ± 0.9 year, weight: 70.95 ± 4.72 kg, height: $169,8 \pm 3.1$ cm) performed treadmill activities at $65\% HR_{max}$ for 30 minutes in a chamber set at $36.6 \pm 0.8^{\circ}C$ of air temperature and $72 \pm 6\%$ of relative humidity followed by 30 minutes recovery. All subject underwent three experiment conditions, without fluid ingestion, with ice slurry made of young coconut water ingestion, and with ice slurry made of isotonic drink. 7.5 gr kg^{-1} of body mass ice slurry ingested 30 minutes prior to the physical activity. Variabel measured during experiment were tympanic temperature, skin temperature, body temperature, body heat storage, heart rate, thermal comfort, thermal sensation, thirst sensation, rate perceived exertion, nausea, drinking pleasure. *Repeated Measure* ANOVA followed with a Bonferonni correction were used as statistical data analysis.

The result showed that ice slurry ingestion significantly decreased tympanic temperature, body temperature, and heart rate compared with no fluid ingestion conditions. Meanwhile, there were no significant difference in skin temperature among conditions. The subjective responses result showed there were significant differences in thermal comfort, thermal sensation, thirst sensation, and rate perceived exertion. There were no different result from physiological and subjective response between two different beverages. However, ice slurry from young coconut water was more pleasurable and preferable than the isotonic one.

Keyword : *ice slurry*, young coconut water, isotonic drink, physiological response, subjective response