Pengaruh penggunaan kafein terhadap kadar asam lemak bebas, frekuensi pernafasan dan tingkat kelelahan selama kerja fisik ringan berdurasi panjang pada manusia dewasa = The Effect of the use caffeine on the levels of free fatty acids, breathing frequency, and level of fatigue during long-duration light exercise in human

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Abstrak

Latar Belakang : Kafein merupakan substansi yang paling banyak di gunakan di seluruh dunia, hampir 80 % dari populasi merupakan pengguna rutin. Efek dari penggunaan kafein bergantung kepada beberapa faktor, antara lain jenis, intensitas dan durasi dari kerja flsik, dosis kafein. Pada suatu populasi, 75% orang dewasa dalam melakukan aktivitas sehari-hari menggunakan energi yang sama pada saat melakukan kerja fisik ringan. Tubuh manusia memiliki kemampuan untuk menyimpan kelebihan energi. Cadangan energi tersebut akan dipergunakan melalui proses penguraian kembali kreatin fosfat rnenjadi ATP Serta Iipolisis, glikogenolisis dan glukoneogenesis. Kafein adalah inhibitor kompetitif dari reseptor dengan ligan adenosine di adiposit. Kafein menghilangkan efek penekanan adenosin terhadap lipolisis. Kafein bersama homlon-honnon lipolitik (epinefrin, norepinefiin, glukagon dan hormon pertumbuhan) bersinergi dalam meningkatkan kadar asam lemak bebas. Kafein dapat meningkatkan ketersediaan oksigen melalui mekanisme blok reseptor adenosin, sehingga efek penekanan adenosin terhadap neuron-neuron di PreB6t.zinger kompleks dalam pembentukkan irarna pernafasan hilang, dan menyebabkan peningkatan frekuensi pemafasan. Kondisi tersebut, membuat kafein dikenal sebagai substansi yang dapat meningkatkan kemampuan Esik dan menurunkan tingkat kelelahan

Tujuan : Mengetahui pengaruh kafein terhadap kadar asam lemak bebas, frekuensi pemafasan dan tingkat kelelahan.

Metode : Penelitian menggunakan disain cross over, pada 8 laki-laki dewasa yang terbagi menjadi dua kelompok yaitu kelompok yang mendapat kafein 3 mg/kg.bb dan kelornpok kontrol yang mendapatkan plasebo. Kadar asam lemak dan frekuensi pemafasan diukur pada saat sebelum perlakuan, sesudah perlakuan dan sesudah kerja fisik. Tingkat kelelahan diukur selama kerja fisik.

Hasil : Setelah kerja fisik kadar asam lemak bebas kelompok kafein mengalami peningkatan yang bermakna dibandingkan kelompok plasebo, frekuensi pernafasan pada kelornpok kafein meningkat tetapi tidak berbeda bemmakna dibanding kelompok plasebo, tingkat kelelahan pada kelompok kafein lebih rendah dibanding kelompok plasebo dan berbeda bermakna secara statistik.

Kesimpulan : Penggunaan kafein 3 mg/kg.bb secara bermalma dapat meningkatkan kadar asam lemak bebas sesudah kerja fisik dan menurunkan tingkat kelelahan selama kerja fisik. Tetapi tidak meningkatkan frekuensi pernafasan secara bermakna.
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Background : Caffeine is the most widely used substance in the world, its regular users comprise almost 80% of the population. The effects of using caffeine depend on a number of factors such as the type, intensity, and duration of physical work, and the dose of caffeine. In a particular population, 75% of adults in doing their daily routine spend as much as energy as when they do light exercise. Human body processes the ability to store extra energy. The stored energy will o utilized through decomposition of creatine phosphate into ATP and lipolysis, glycogenolysis ang gluconeogenesis. Caffeine is a competitive inhibitor of a receptor with ligand adenosine in adipocyte. Caffeine bounds to the receptor, but since it inhibits the adenosine effect, caffeine increases lipolysis. Caffeine along with lipolytic hormones (epinephrine, norepinephrine, glucagons and growth hormone) increases the levels of free fatty acids. Caffeine can increase the availability of oxygen through adenosine receptor blockade mechanism, which results in the disappearance of the pressing effect of adenosine against neurons of PreB6tzinger complex in the formation of breathing pattern, and it can increase breathing frequency. That condition makes caffeine known as a substance which can increase physical ability and reduce the level of fatigue.

Objective : To discover the effects of caffeine on the levels of free fatty acids, breathing frequency, and the level of fatigue.

Method : The research used the cross»over design in 8 males, conducted in two groups: the group receiving 3 mg/kg body weight and the control group receiving placebo. The levels of fatty acids and breathing frequency were measured prior to the procedure, after the procedure and after exercise. The level of fatigue was measured during exercise.

Results : After exercise, levels of free fatty acids in the group with the caffeine increased significantly than that in the group receiving placebo, the breathing frequency in the caffeine group increased but it was not significantly than that in the palcebo group, and the level of fatigue in the caffeine group was lower significantly than that in the placebo group.

Conclusion : The use of caffeine 3 mg/'kg body weight significantly increases the levels of free fatty acids after exercise and reduces level of fatigue during exercise. However, it does not cause a significant increase in the breathing frequency.