ROLE OF ALPHA AND BETA ADRENOCEPTORS IN THE SYMPATHETICALLY
MEDIATED THERMOREGESIS IN MEN.
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This study was intended to investigate the role of α- and β-adrenoceptor populations in the sympathetically mediated thermoregulation. For determining the role of the β-receptors, 10 healthy male lean volunteers (means;SEM, age:25±2.1 yrs) were measured twice with 3-7 days in between. In random order, the β1-blocker atenolol (AT, bolus: 0.07 mg/kg/24, infusion: 0.1 mg/kg/h) or saline were infused. After 30 min, a continuous infusion of increasing doses of the β1- and β2-agonist isoprenaline (ISO: 5.1-25.9 mcg/kg/min, each for 30 min) was added. Whole body energy expenditure (EE) was measured by an open circuit ventilated hood system. There was a significant increase in EE after infusing ISO+AT (for the different doses: 8.9.10 and 14% respectively, p<0.001) and an almost twofold higher increase after infusion of ISO only (respectively: 7.16, 26 and 25%, p<0.001). Also, the increase in heart rate (HR) with ISO+AT was half of the increase with ISO. The effect of stimulation of α1-adrenoceptors on EE was measured in six healthy male lean volunteers (age:24±2.1 yrs) by infusing increasing doses of the α1-agonist phenylephrine (0.5,1.2 mcg/kg/min, each for 30 min). EE did not change, while blood pressure (BP) increased (p<0.001) and HR decreased (p>0.05). In addition to this study, the role of the α2-receptors was investigated in six healthy male volunteers (means;SEM, age:25±2.1 yrs) by continuous infusion of the α1- and α2-agonist norepinephrine (2.5.5.10 mcg/kg/min, each for 30 min) with simultaneous infusion of the β1- and β2-blocker propranolol (bolus: 195 mcg/kg, infusion: 0.6 mcg/kg/min). There was no effect on EE, while BP increased (p<0.01). In conclusion, in healthy male lean volunteers both β1- and β2-adrenoceptors are involved in the sympathetically mediated thermoregulation, while the α1- and α2-

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EFFECTS OF HEPTANOL, K+ AND TTX ON REENTRY VENTRICULAR TACHYCARDIA IN ANISOTROPIC MYOCARDIUM.
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In sheets Langendorff perfused anisotropic rabbit left ventricular myocardium, epicardial rings were created by a cryoprobe procedure. Reentrant ventricular tachycardia (VT) with a cycle length (CL) of 143 ± 13 ms could be reproducibly induced by programmed electrical stimulation. In the ring, conduction parallel to the fiber orientation was fast (80 ± 10 cm/s) compared to conduction perpendicular to the fiber orientation (8 ± 21 ± 3 cm/s) with a ratio of 3.3 ± 0.5 (8 ± 21). In 10 experiments the passive membrane properties were altered by increasing the intercellular coupling resistance with heptanol (HT). By raising HT to 3.0 mM, VT could be induced to a CL of 357 ± 84 ms. WT was more decreased than WT to 5 ± 4 and 46 ± 12 cm/s with an increase in ratio to 5.0 ± 1.0 (p<0.001). In addition at 5 ± 4 and 46 ± 12 cm/s, transverse conduction block terminated VT in 8 of 10 experiments. Depression of the active membrane properties by increasing extracellular K+ from 4.0 to 10.0 mM, allowed VT to a CL of 255 ± 96 ms. WT was increased by 30% to 36 ± 15 and 15 ± 4 cm/s, decreasing the ratio to 2.6 ± 0.9 (p<0.001). In 7 of 10 experiments longitudinal conduction block terminated VT at 11.6 ± 1.8 ms of K+. In 5 experiments, administration of the selective sodium channel blocker TTX (25 μM) and/or TTX (25 μM) also terminated VT by longitudinal conduction block.

Conclusion: Depression of the fast sodium channels by K+ or TTX preferentially affects longitudinal conduction while increasing intercellular coupling resistance by heptanol preferentially depresses transverse conduction. This may have important implications for anti-arrhythmic therapy by drugs.

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THE EFFECT OF HAND HEATING BY A WARM AIR BOX ON DEEP VENOUS OXYGEN SATURATION AND BLOOD FLOW OF THE CONTRALATERAL ARM BEFORE AND AFTER A GLUCOSE LOAD.
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Aetorisation of venous blood is often used in studying forearm metabolism. Astrup et al (1) showed that heating of the hand by a warming blanket caused a redistribution of blood flow in the contralateral arm and thus introduced errors in forearm skeletal muscle flux calculations. The present study was undertaken to investigate how hand heating by a warm air box (60°C) would affect metabolism and blood flow in the contralateral arm before and after a glucose load. Eleven healthy male volunteers (BM,6F, age: 22-41 yrs) underwent an oral glucose tolerance test (O GTT) on two different occasions, one with and one without heating of the contralateral hand in random order. In the heating experiment, the heating was started after 30 min of supine rest. In both experiments, glucose was given after 1 h. Skin and rectal temperature (ST and RT), deep venous oxygen saturation of hemoglobin (SO2c), forearm blood flow (FBF) and oxygen consumption of the forearm (O2c-flux) were followed, every 15 (ST and RT) or 30 min (other), for 1 h before and for 1 h after the glucose load. Heating the hand for 30 min before glucose intake did not affect ST, RT, SO2c, FBF or O2c-flux. Although, after the glucose load, heating increased FBF (p<0.05), the integrated response after glucose was not significantly different between control and heating experiments (mean ± SEM: 67±43 and 117±41 ml/min/100ml tissue). With both conditions, there was an increase in the integrated response of ST (control: 382±29, p<0.001 and heating: 416±007, p<0.001) and O2c-flux (control: 250±73, p<0.01 and heating: 39±190, p<0.05) after glucose intake. These responses did not differ significantly between the conditions. Also, there were no significant differences in the other variables after the glucose load between the control and heating experiment. In conclusion, hand heating by a warm air box has no effect on deep venous oxygen saturation and little effect on forearm blood flow of the contralateral arm. Therefore, it is a reliable method for obtaining arterialized blood in forearm balance studies.


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THE READINESS POTENTIAL AND CURRENT SOURCE DENSITY PRECEDING SELF-PACED MOVEMENTS.
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Preceding a self-paced movement the Readiness Potential (RP) can be recorded, starting 1.5 s before movement onset. After a bilateral symmetric phase the RP is known to be larger contralateral to the movement side for hand movements and unilaterally dominant for foot movements. In this experiment 9 subjects performed self-paced brisk movements with the right hand from four lines successively. Both smoothed potentials and current source densities (CSD: Njor's method) were subjected to an ANOVA with Response-side (R), Hemisphere (H), Limb (L) and Electrode position (E) as repeated measures. From 500 ms before movement onset onwards the potentials show significant RP±H interactions (p<0.05). For the CSD data the RP±H interaction starts at ~900 ms. For hand data the early bilaterally symmetric phase of the RP is absent from the grand average CSDs which show a sink at the vertex together with a uniquely contralateral sink at lateral electrodes (from 1500 ms onward). The individual CSDs are also more consistent in this respect than the dominance in individual potential data (shown by t vs. 5 and by 5 and 4). For hand movements the CSDs do not show any lateralization at all, while the potentials become larger ipsilateral at ~300 ms.

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