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论文

枳实及其升压有效成分与多巴胺、多巴酚丁胺对心脏功能和血液动力学的对比研究

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摘要:

麻醉犬实验表明枳实及其有效成分辛弗林和N-甲基酪胺与多巴胺、多巴酚丁胺相似,能显著增强多种心肌收缩性和泵血功能的指标:增大左室压变化速率峰值和在共同最高等容收缩压(CPIP)时的心肌收缩成分的缩短速率(V_{CE}),增加心脏指数(GI),缩短左室从开始收缩到开始射血的时间,降低左室舒张末压。由于在CPIP时的V_{CE}不受心室后负荷(动脉压)的影响,故可以排除上述指标的增强是由于药物对血压的影响。由于枳实及其有效成分的强心、增加心输出量和收缩血管提高总外周阻力,导致左室压力和动脉血压上升,这是它们抗休克的药理学基础。N-甲基酪胺升高外周阻力的作用比枳实和辛弗林稍弱,但加快心率的作用则较强。这两种成分在作用上是各有特点的。在增加心搏指数等效剂量下,枳实、辛弗林、N-甲基酪胺与大剂量多巴胺增加左室作功指数和射血的张力-时间指数的比值远超过增加心搏指数的百分率,这可能是升压增加左室后负荷造成的。多巴酚丁胺和小剂量多巴胺不同于枳实及其有效成分在于能降低外周血管阻力,降低动脉血压,而不明显增加左室作功指数和射血的张力-时间指数,提示不象枳实那样增加心肌的能量消耗。

关键词:

STUDIES OF *CITRUS AURANTIUM* AND ITS HYPERTENSIVE INGREDIENTS ON THE CARDIAC FUNCTIONS AND HEMODYNAMICS IN COMPARISON WITH DOPAMINE AND DOBUTAMINE

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Abstract:

In order to elucidate the mechanism of hypertensive and antishock effects of *Citrus aurantium* L. and its active principles (synephrine and N-methyltyramine), carotid arterial blood pressure (BP), left ventricular pressure (LVP), left ventricular end diastolic pressure (LVEDP), the first derivative of the left ventricular pressure (dp/dt), central venous pressure (CVP), EGG, heart rate (HR), and cardiac output (CO) were monitored in 6 anethetized open chest dogs. The tracings were recorded on RM-86 Polygraph. EGG, LVP, LVEDP and dp/dt signals were recorded simultaneously on Data Recorder and were reproduced in speed of 100 mm per sec. after experiment, so as to measure the numeral value of LVEDP, t-dp/dt, tension time index of ventricular ejection (TTI) and common peak isovolumetric pressure (CPIP). Cardiac index (CI), stroke index (SI), left ventricular work index (LVWI), peripheral vascular resistance (PVR), and dp/dt/CPIP (VcEat CPIP)were calculated. *Citus auruntium* extract (0.5g/kg), synephrine (1 mg/kg), N-methyltyramine (0.25 mg/kg) with the well-known cardiac stimulants dopamine (DA), dobutamine (DB) as positive control were injected in sequence of Latinsquare design.All drugs markedly increased the cardiac function indices in similar patterns including increase of dp/dt max, V_{CE} at CPIP and CI; shortening of t-dp/dt max. and lowering of LVEDP. Since V_{CE} at CPIP is independent of variations of ventricular afterload initiated by these drugs, it was concluded that similar to DA and DB, crude extract of *Citrus aurantium* and its active principlcs do possess inotropic action by increasing myocardial contractility. It is their pump-stimulant action and elevation of PVR that offer the pharmacological basis to their anti shock effect. As to the relative efficiency on PVR, N-methyltyramine was weaker than crude extract of *Citrus aurantium* and synephrine. As to the heart rate stimulant action, the reverse was true.At the equivalent dosage to CI increment, crude extract of *Citus aurantium* synephrine, N-methyltyramine and hypertensive dose of DA augmented the LVWI and TTI×HR (as energy and oxygen consumption index) far beyond the ratio of CI increment. This difference could attribute to the increase of ventricular afterload as a result of vasoconstriction.DB and DA in small doses lowered arterial blood pressure and PVR. Consequently the LVWI and TTI×HR were not significantly altered.

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