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Redistribution of cardiac output by azaperone and metomidate in conscious pigs

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Butyrophenone compounds belong to the group of "major tranquillizers" (neuroleptics). Representatives of this group are used both in human (droperidol) and animal (azaperone) practice (Green, 1982). Azaperone (4'-fluoro-4(2-pyridyl-1-piperazinyl)-butyrophenone) is widely used in pigs as a sedative when physical restraint or diagnostic procedures are required. In addition, the drug is frequently employed in combination with the veterinary analogue of etomidate, metomidate (methyl-1-(α-methylbenzyl)imidazol-5-carboxyl-hydrochloride), which provides adequate analgesia for short-term surgical procedures in pigs. In recent years several investigators have started to use this combination either for induction and/or as an anaesthetic regimen for physiological preparations, which demands for a better understanding of the cardiovascular actions of these agents. We therefore studied the effects of azaperone (5 $mg.kg^{-1}$, i.m.) alone and after addition of metomidate (6 $mg.kg^{-1}$, i.v.) in 8 instrumented conscious pigs (Duncker et al., 1988). Fifteen minutes after administration of azaperone arterial blood pressure was markedly decreased, which was mainly due to systemic vasodilatation. Although cardiac output was only slightly reduced there was a marked redistribution in favour of the arteriovenous anastomoses at the expense of the nutritional channels (cappillaries). Flow to the brain was maintained, but to the left ventricle decreased parallel to the fall in arterial blood pressure (see table). Addition of metomidate had no effect on cardiac output. Therefore the increase in blood pressure must have resulted from systemic vasoconstriction. The latter was most noticeable in the brain, left ventricle and skeletal muscle. We conclude that in the doses used, azaperone alone but also in combination with metomidate has only a moderate effect on cardiac output. However, it causes a profound redistribution in favour of the arteriovenous anastomoses, which may explain the hypothermia that is observed with this drug (Green, 1982).

	Conscious	Azaperone	Azaperone metomidate
Systemic haemodynamics			
heart rate (beats/min)	108 ± 2	116 ±10	91 ± 6 *+
mean arterial blood pressure (mmHg)	90 ± 5	61 ± 7 *	68 ± 5 *
cardiac output (l/min)	2.3 ± 0.1	2.1 ± 0.1	2.0 ± 0.1
arteriovenous anastomotic flow (l/min)	0.06± 0.01	0.44± 0.04 *	0.59± 0.09 *
nutrient cardiac output (l/min)	2.2 ± 0.1	1.6 ± 0.1 *	1.4 ± 0.1 *
Regional blood flows (ml/min/100 g)			
brain	74 ± 4	74 ± 4	35 ± 3 *+
left ventricle	132 ± 6	94 ±11 *	74 ± 9 *
kidneys	366 ±36	244 ±40 *	252 ±34 *
skeletal muscle	13.6 ± 4.7	8.3 ± 2.6	3.2 ± 0.3 *
skin	6.8 ± 1.0	2.0 ± 0.3 *	1.1 ± 0.3 *+

*P < 0.05 vs conscious; + P < 0.05 vs azaperone

References

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