

EFFECT OF OBESITY ON DOXAPRAM HYDROCHLORID-INDUCED EFFECTS ON WHOLE BODY BAROMETRIC PLETHYSMOGRAPHY MEASUREMENTS IN HEALTHY BEAGLE DOGS

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Doxapram hydrochlorid (Dxp) is a respiratory stimulant. The present study investigates the effects of body weight (BW) gain on basal respiratory parameters, as well as in response to Dxp administration, measured by barometric whole body plethysmography (BWBP), a non invasive respiratory function test. Six 6-year-old beagle dogs (4 M, 3 F) were investigated before (N = normal body score, mean weight \pm SD = 14,0 \pm 0.9 kg) and after 30 weeks being fed with a dry high-fat diet (O = obese dogs, weight \pm SD = 19.7 \pm 1.6 kg). Dogs were sedated (acepromazine 0.03 mg/kg and buprenorphine 15 μ g/kg). BWBP parameters (respiratory rate = RR, tidal volume = TV, tidal volume per kg = TV/BW, minute volume = MV, minute volume per kg = MV/BW, peak inspiratory and expiratory were evaluated before and during at least 5 minutes after Dxp IV injection (1.1 mg/kg). Mean values after Dxp injection were calculated min per min and compared with mean values before Dxp injection using an anova test for repeated measures. Values obtained after Dxp were also expressed in percentage of the basal value (%-Dxp). Results obtained in N and O dogs were compared with a t-test for paired data (P < 0.05).

Obesity induced essentially a significant increase in RR, MV and MV/BW and a significant decrease in TV, TV/BW, Ti and Te. In both N and O dogs, Dxp mainly induced an immediate significant increase in TV, in TV/BW, in PIF/BW, in PEF/BW, in MV, in MV/BW as well as an immediate significant decrease in Te. Moreover, an increase in Ti and RR and a decrease in Te/Ti were observed, but this was significant in N dogs only. %-Dxp in TV, TV/BW 1 min after Dx was significantly lower in O than in N.

Results of basal BWBP parameters (mean \pm SEM)

	RR	TV	TV/BW	MV	MV/BW	PIF/BW	PEF/BW	Ti	Te
M	11.4 \pm 0.9	137.8 \pm 8.0	9.8 \pm 0.5	1595.5 \pm 178.3	112.5 \pm 11.3	13.4 \pm 0.7	10.4 \pm 1.2	1.3 \pm 0.1	4.3 \pm 0.6
O	33.8* \pm 7.9	112.7* \pm 12.8	5.7* \pm 0.6	3249.13* \pm 437.8	166.6 \pm 25.2	12.7 \pm 1.0	8.3 \pm 0.9	0.83* \pm 0.2	1.7* \pm 0.4

* : significantly different from parameters in N dogs.

%-Dxp in BWBP parameters 1 minute after Dxp (mean \pm SEM)

	RR	TV	TV/BW	MV	MV/BW	PIF/BW	PEF/BW	Ti	Te
M	151.4 \pm 3.5	363.5 \pm 26.0	363.5 \pm 26.0	572.5 \pm 127.2	572.5 \pm 127.2	239.7 \pm 15.5	250.5 \pm 12.1	133.9 \pm 6.2	66.0 \pm 12.3
O	127,9 \pm 14,4	292,5* \pm 22,6	292,5* \pm 22,6	364,1 \pm 34,5	364,1 \pm 34,5	224,6 \pm 16,7	270,3 \pm 23,3	120,2 \pm 13,8	73,4 \pm 14

* : significantly different from parameters in N dogs.

In conclusion, obesity induces modifications of basal respiration parameters as well as an impaired response to stimulation by Dxp. Dxp and WBBP is an interesting combined procedure that could be helpful in characterizing the ventilatory deficit in dogs with restrictive pulmonary diseases, and presumably in assessing the progression of the disease and response to therapy.