

Ultrastructural and physiopathological glomerular filtration barrier after experimental endotoxin shock

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Tab. 3: Oestradiol and Progesterone serum levels

Day	Treated					Controls			
	0	E ₂	15	95	31	12	12	15	17
	Pg	0.1	0.3	0.1	0.1	0.1	0.1	1.4	12.5
24	E ₂	100	30	14	9	31	18	10	15
	Pg	1	0.6	1.6	0.2	29	18	28	40
48	E ₂	7	33	5	11	11	31	15	37
	Pg	0.1	0.1	0.2	0.3	25	12	29	0.3

E₂ = pg/ml Pg = ng/ml

In summary, clenbuterol long-term administration significantly affects uterine ER and PgR concentrations in female pigs, as well as we have found in previous experiments carried out in female rats (3) and in cows (unpublished data). Furthermore, the modifications

observed in treated animals, are related with estradiol and progesterone serum levels. Data obtained suggest that clenbuterol may cause changes, producing a lack in ovarian activity, confirmed by the histological findings reported in the Note 2. The mechanism by which clenbuterol exerts this action is not clear, but we may suppose two contrasting ways: a direct effect on steroid receptors or an indirect effect upon the ovaries mediated via the hypothalamic-hypophyseal axis.

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ULTRASTRUCTURAL AND PHYSIOPATHOLOGICAL GLOMERULAR FILTRATION BARRIER AFTER EXPERIMENTAL ENDOTOXIN SHOCK

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The aim of the present work was to evaluate the relationship between physiopathological parameters (plasma proteins and urine test) and renal histopathology particularly structural architecture of the glomerular filtration barrier, in experimental endotoxin shock.

Material and methods

In the present work a histopathological study is carried out on the glomerular filtration barrier in 20 Large-white pigs weighing 20 kg, subjected to experimental intravenous inoculations of endotoxin from *Salmonella enteritidis*.

The study is completed with the determination of plasma protein levels and with urine tests: determination of pH, density, proteins, glucose, ketone body levels and urinary sediment.

processes in which high molecular compounds (immune complexes) are deposited on or within the barrier. Proteinuria may result from a decreased capacity for tubular resorption or tubular damage, but mostly proteinuria is a consequence of altered glomerular filtration. Decrease in urinary output characteristic of prolonged septic shock processes, is closely connected with the increase of protein catabolism and proteinuria (Shirota et al., 1983).

Furthermore, the density of the urine is higher in the last groups, which correlates with the tubular disintegration detected and the presence of calcium oxalate crystals (Rosenbruck et al., 1984; Redondo et al., 1987). Likewise, this increase of density is characteristic of prolonged shock processes.

Table 1. Procedure of the experiment

Group	Experimental Animals	Control	Shock Time	Doses
I	4	I	10 days	2
II	4	I	20 days	4
III	4	I	30 days	6
IV	4	I	50 days	8

Dose 0.125 mg of *S. enteritidis* endotoxin per Kg body weight.

Results and discussion

Histopathological findings: The glomerular basement membrane showed an increase in its diameter parallel to the number of doses inoculated and the time of shock; an increase which always coincided with the degree of structural disorganization (Redondo et al., 1987).

Physiopathological findings: The effective and selective glomerular filtration barrier to diffusion is probably the basement membrane. The permeability of the basement membrane may be altered in shock

Table 2. Urine and blood test

Urine Test	Control	Group I	Group II	Group III	Group IV
Transparency	bright	turbid+	turbid+	turbid+	turbid+
pH	6.2±0.2	5.2±0.3	5.3±0.1	5.1±0.3	4.9±0.2
Density	1.015±0.02	1.015±0.1	1.020±0.01	1.030±0.02	1.035±0.02
Proteins	—	—	5.4±0.3 g/dl	6.3±0.4 g/dl	7.9±0.2 g/dl
Glucose	—	—	—	—	—
Ketone bodies	—	—	—	—	—
Sediment	—	—	—	—	—
Erythrocytes	—	—	—	—	—
Leukocytes	—	—	—	—	—
Epithelial Cells	—	+	++	+++	+++
Crystals	—	calcic oxalate+	calcic oxalate+	calcic oxalate++	calcic oxalate++
Cylinders	—	+++	+++	+	+
- Hyaline	—	+++	+++	+	+
- Epithelial	—	+	+	+++	+++
- Cereous	—	+	+	+++	+++

Blood Test

	Control	Group I	Group II	Group III	Group IV
Total Proteins	8.5±0.2	7.2±0.3	6.3±0.2	4.5±0.46	4.3±0.3

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CLINICAL AND PATHOLOGICAL FINDINGS IN SPONTANEOUS B.R.S.V. INFECTION IN YEARLING LAMBS

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Since 1968, when Dogget et al. first neutralized human R.S.V. in bovine serum, the involvement of R.S.V. in respiratory disease has been confirmed in cattle (Castlemann et al., 1985) as well as in other species, notably sheep (Cutlip et al., 1979). The purpose of this study was to analyze the clinical, hematological and pathological characteristics of a group of 8 lambs with B.R.S.V.

Material and methods

A clinical examination was carried out and rectal temperature, heart-rate and respiration-rate were recorded. Blood counts were accompanied by hemochromometric tests. Lambs were slaughtered and samples were routinely processed for virological analysis using cell cultures (Giemsa and T.E.M.), pathological analysis (T.E.M. and light microscopy) and immunological analysis (immunohistochemistry and IFI).

Results

Clinical examination

Animals	1	2	3	4	5	6	7	8
General condition					<	<	<	<
Anorexia	50%	50%	50%	50%	50%	50%	50%	50%
Conjunctivitis	+	+	+	+	++	++	+++	+++
Nasal discharge	++	+	+	+	++	++	+++	+++
Cough		+	-	-	+	++	++	+++
Heart-rate	81	78	92	94	101	100	110	107
Respiratory-rate	60	63	76	73	65	60	65	80

(-) = Absence; () = moderate decrease; (<) = severe decrease; (+) = moderate increase; (+++) = severe increase.

Blood counts

Animals	1	2	3	4	5	6	7	8
Erythro. (10 ⁶) mm	11.2	11.5	9.8	10.2	10.5	10.6	8.9	8.9
Hematocrit. (%)	34.4	34.8	32	33.6	33.5	34.9	30.6	30.9
Hb (gr/100 ml)	11.9	11.7	10.8	10.9	11.2	11.6	10.2	10.2
Leukocyte (10 ³) mm	14.8	13.8	13.7	15	14.2	14.3	15.5	16.1

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Virological findings: The observation of syncytia gave evidence of a cytopathic effect. Each syncytium contained 7-8 nuclei. Ultrastructural analysis revealed mature and geminating viral particles on the cell surface and within the cytoplasm.

Pathological findings: Gross pathology: Animals 1-6 showed in dorsocaudal areas evidence of acute interstitial pneumonia, with interlobular edema and subpleural and interlobular interstitial emphysema. Animals 7 and 8 simultaneously showed lesions caused by fibrinous bronchopneumonia in cranioventral areas.

Histopathological findings: In animals 1-6, interstitial pneumonia was accompanied by a thickening of interalveolar septal due to abundant mononuclear infiltration. Clusters of inflammatory cells linked in syncytial configurations were visible in the alveolar and bronchial lumen. Animals 7 and 8 showed evidence of bronchiolitis obliterans with fibrino-cellular exudation, particularly in cranioventral areas.

Immunological findings: Fluorescence obtained with various anti-gens:

Animal	BRSV	IBRV	PI III virus	BVD virus	P.hemolyt.
1	1/640	-	-	-	-
2	1/640	-	-	-	-
3	1/640	-	-	-	-
4	1/320	-	-	-	-
5	1/320	-	-	-	-
6	1/640	-	1/20	-	-
7	1/640	-	-	-	1/320
8	1/320	-	-	-	1/320

Immunohistochemistry (PAP): Positive reactions were observed in non-ciliated cells of bronchial epithelia, in macrophages and mononuclear cells in the bronchial and alveolar lumen and in macrophages in the alveolar interseptum.

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