

海草給与によると思われる馬の甲状腺腫大例について

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BRIEF NOTE

**Nodular Goiters of Three Mares and Their Foals,
Induced by Feeding Excessive Amount of Seaweed**

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Clinical cases of nodular goiters of 3 mares and their foals in a farm, probably induced by the administration of excessive iodine are reported. Mares were 7, 8 and 8 year-old and foals 7, 13 and 14 days after parturition at the time of consultation. Of these foals, 2 were male and 1 was female.

These mares were kept on ration consisting of 2 Kg of hay, 2.7 Kg of wheat bran, 2 Kg of oats, salt, calcium and over 60 g of feed additive which was mainly consisted of seaweed. The amount of iodine contained in this feed additive was 520-580 mg/Kg. As the results mares were fed over 30 mg (about 60 μ g/Kg body weight) of iodine daily throughout their gestation period. Daily requirement of the horse for iodine is 2-4 μ g/Kg body weight according to Maynard [6], but the maximum quantity of iodine which does not cause trouble is not clear in any report.

Clinical findings: Size of goiters was from the thumb tip to a hen egg in mares and from a hen egg to a fist in foals. By palpation, they were hard in consistency, but did not show pain. There were no abnormality in temperature, pulse and any other clinical findings.

Blood examination: RBC, Hb, Ht, WBC,

differentiation of white cells, total protein, serum protein electrophoretic pattern, cholesterol, ALP, GOT, GPT, LDH, Ca and P were determined with no abnormal deviation from the control mares and foals of the same age. In order to examine the function of thyroid gland, PBI, T_4 and T_3 in serum were assayed. Since there is rather a wide variation of these hormones in the blood in mares and foals in reference [1-5], no value among the mares and foals was beyond the normal range. The biopsy of thyroid was not carried out. With the above findings the termination of feeding of feed additives was immediately indicated.

After 2 months these goiters markedly reduced in sizes and at the same time they became soft in consistency. The similar blood examination was carried out with no abnormality again. From those findings of thyroid hormones, this goiter was not functional at all. Thus we diagnosed this as nodular goiters which was induced by feeding the excessive amount of iodine. The upper limit of iodine, which will not cause trouble, is certainly below 60 μ g/Kg body weight.

Table 2. Blood examination in the foals

	Clinical case			Control		
	a	b	c	a	b	c
RBC	10 ⁴ /mm ³	740	944	707	1003	
Hb	g/dl	10.1	13.3	10.1	11.0	
Ht	%	29.0	31.5	29.0	31.0	
MCV	μ ³	39.2	33.4	41.0	30.9	
MCH	μg	13.6	14.1	14.3	11.0	
MCHC	%	34.8	42.2	34.8	35.5	
WBC	10 ³ /mm ³	59	91	79	94	
Baso	%	1.0	0	0		
Eosino	%	0	0.5	0		
Band	%	9.0	7.5	9.0		
Seg	%	51.0	53.5	55.0		
Lympho	%	35.0	36.5	30.0		
Mono	%	4.0	2.0	6.0		
Protein T.	g/dl	6.0	6.0	6.3	6.4	
Albumin	g/dl	3.32	3.18	3.29	3.48	
α ₁ -glob.	g/dl	0.10	0.16	0.07	0.13	
α ₂ -glob.	g/dl	0.47	0.76	0.59	0.56	
β ₁ -glob.	g/dl	0.71	0.72	0.79	0.71	
β ₂ -glob.	g/dl	0.38	0.38	0.28	0.55	
γ-glob.	g/dl	1.03	0.80	1.28	0.97	
A/G		1.24	1.12	1.10	1.19	
Cholest. T.	mg/dl	198	212	242	248	
F.	mg/dl	38	76	75	50	
E.R.	%	80.7	64.0	69.3	79.8	
ALP	KAu/dl	86.5	52.8	36.2		
GOT	Ku/ml	44.0	29.5	32.0		
GPT	Ku/ml	7.5	6.0	8.5		
LDH	Wu/ml	650	670	560		
Ca	mg/dl	10.4	7.0	6.2		
P	mg/dl	7.5	7.9	8.5		

Table 1. Blood examination in the mares

	Clinical case			Control		
	A	B	C	1	2	
RBC	10 ⁴ /mm ³	738	1092	763	1010	999
Hb	g/dl	14.5	18.1	13.5	17.0	15.6
Ht	%	38.0	49.0	31.5	49.0	44.0
MCV	μ ³	51.5	44.9	41.3	48.5	44.0
MCH	μg	19.6	16.6	17.7	16.8	15.6
MCHC	%	38.2	36.9	42.9	34.7	35.5
WBC	10 ³ /mm ³	105	100	75	81	44
Baso	%	1.0	2.0	1.0	1.0	3.0
Eosino	%	7.0	0	4.0	5.0	8.5
Band	%	2.0	9.0	1.0	1.0	0
Seg	%	36.0	41.0	57.5	64.0	40.5
Lympho	%	53.5	47.0	33.5	23.5	43.5
Mono	%	0.5	1.0	3.0	5.5	4.5
Protein T.	g/dl	6.0	6.8	6.4	6.4	6.0
Albumin	g/dl	3.59	3.48	3.33	3.17	3.36
α ₁ -glob.	g/dl	0.07	0.12	0.08	0.20	0.20
α ₂ -glob.	g/dl	0.50	0.62	0.70	0.60	0.61
β ₁ -glob.	g/dl	0.89	1.26	0.85	0.45	0.62
β ₂ -glob.	g/dl	0.46	0.61	0.40	1.00	0.65
γ-glob.	g/dl	0.48	0.72	1.03	0.99	0.55
A/G		1.49	1.05	1.08	0.93	1.27
Cholest. T.	mg/dl	90	108	90	85	112
F.	mg/dl	22	29	24	20	11
E.R.	%	75.8	73.1	73.8	76.5	90.2
ALP	KAu/dl	20.8	21.4	17.0	14.9	19.1
GOT	Ku/ml	57.5	51.0	44.0	49.0	48.5
GPT	Ku/ml	2.0	1.0	3.5	4.0	3.5
LDH	Wu/ml	470	470	370	315	385
Ca	mg/dl	5.5	13.2	11.3	12.5	8.7
P	mg/dl	2.8	4.5	2.9	3.7	3.9

Table 3. Assay of thyroid hormone in the mares

		Clinical case			Control	
		A	B	C	1	2
PBI	$\mu\text{g}/\text{dl}$	1.9	2.0	1.8	2.0	2.0
T ₄	$\mu\text{g}/\text{dl}$	1.2	3.0	0.4	1.8	2.0
T ₃	ng/dl	96	40	35	88	72
T ₄ +T ₃	$\mu\text{g}/\text{dl}$	1.3	3.0	0.4	1.9	2.1

Table 4. Assay of thyroid hormone in the foals

		Clinical case			Control
		a	b	c	1
PBI	$\mu\text{g}/\text{dl}$	9.9	5.4	5.2	13.4
T ₄	$\mu\text{g}/\text{dl}$	9.1	6.3	4.8	17.5
T ₃	ng/dl	424	296	308	463
T ₄ +T ₃	$\mu\text{g}/\text{dl}$	9.5	6.6	5.1	18.0

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Explanation of Figure

Fig. 1. Nodular goiters of the foal.

