

SURVEY REPORT HYPERPLASIA OF GUMS DURING PREGNANCY IN SHEEP

There is a wide divergence of opinion with regard to the effect of pregnancy on dental and periodontal health. One cannot doubt about the increased physical stress, hormonal imbalance and nutritional disorder, particularly proteins and minerals under the influence of new metabolic demands which are increased during pregnancy.

Root and Boot (1933) confirmed increase of basal metabolic requirements of pregnant women from 23 to 25% whereas Harrop (1930) believes in higher percentage. Marshall Day (1933) is definite about the physical stress during period of gestation and subsequent months during which child is directly dependent upon its mother for substance.

The study was made to observe the clinical changes in the gingival tissue of sheep after the onset of pregnancy. The first survey report of 384 sheep of different breeds represents the conditions of the gums before service and 87.8% possesses the normal gums. Insignificantly low proportion (only 12.2 %) exhibited Grade I hyperplasia as such some of the ewes were mated (0-15 days) before our visit to Livestock Experiment Station at Bahadurnagar, Okara, District Sahiwal 29.9.1968.

The results of the 1st examination are given in Table No. 1 and 2.

CONDITION OF GUMS

TABLE NO. 1

Sr No	Breed of Sheep	No. of ewes observed	Percentage distribution			
			Normal Gums	Hyperplasia (Gr.I)	Hyperplasia (Gr.II)	Hyperplasia (Gr.III)
1.	Lohi (L)	164	86.0	14.0	-	-
2.	Kachhi (K)	52	77.8	22.2	-	-
3.	Awassi (A)	85	92.9	7.1	-	-
4.	Lxa (X-1)	28	82.1	17.9	-	-

5.	Kxa (X-2)	7	100.1	-	-	-
6.	Kxa (X-1)	55	90.0	9.1	-	-
7.	Total Av.	384	87.2	12.8	-	-

CONDITION OF TEETH

Abnormal teeth (Nos.)

TABLE NO. 2

Normal Teeth	Fused	Missing	Misplaced	Fractured	Caries
157 (L)	1	2	3	4	-
50 (K)	1	-	-	-	-
77 (A)	-	2	2	1	1
28 (K-I)	-	-	-	-	-
7 (X-1)	-	-	-	-	-
55	-	-	-	-	-
374	2	7	5	5	1

On 12th January, 1969 (after some 3 ½ months of pregnancy) some flock of 361 sheep out of a total of 384 was studied 23 being dead/culled. (See Appendix).

Results and finding

On 2nd examination (some 3 ½ months after pregnancy) 361 ewes of the same herd were examined for clinical examination to see the effect of pregnancy on gingival tissue. Some of the ewes had already lambed. The observations were classified and a comparative study of 1st visit (on 29.9.68 almost prior to mating) and 2nd examination was taken.

Out of the lot, 95% of pregnant sheep were found with gingival hyperplasia and four sheep with pregnancy epulis. Only 5% showed no change in the gums, whereas 28.2% had grade I, 56% grade II and 10.8 % grade III hyperplasia.

From the results of clinical examination of sheep before and after service, the study shows that pregnancy affects the gingival condition, both in human (Soofi and Soofi 1962) and in animals. The possible cause of change in the gingival condition of the animal and the social animals is due to hormonal imbalance during such periods. One cannot blame merely the nutritional disorder especially in case of sheep which are under the care of technical personnel before, during and after pregnancy, in an experimental station. The feed is controlled and all the other possible measures are taken.

Four cases of pregnancy TUMOUR were recorded. 5% of the pregnant sheep possessed normal gums whereas among the rest, 28.2% had hyperplasia of Grade I, 56% Grade II and 10.2 % Grade III. These results were identical with the previous work of Soofi and Soofi (1962) on 42 women, where hyperplasia of gums was observed in pregnant mothers.

Result is reproduced below in Table 4

No. of cases examined	Total No. of pregnancies	Hyperplasia	Free
6	3	4	2
9	4	7	2
3	5	3	-
3	6	3	-
9	7	7	2
12	8	9	3
42	-	33	9
Total % 100	-	78.57	21.43

Discussion

Rogers and Keen (1954) observed that increase in estrogen during pregnancy activates the epithelial structure and inhibits the Mesenchyma, Loe (1965) made a study on 121 pregnant mothers to compare with that of 61 women after labour. The quality and behaviour of the oral debris was the same in the two different groups. Oral hygiene and gums inflammation was closer after parturition than during pregnancy. Study suggests for some other factor for accentuating the inflammatory changes. Loe (1965) believes in a strong relationship with sharp rise in sex hormone blood levels particularly oestrogens.

Rehstenier (1963) suggests Schiller's Iodine test for detection of Glycogen. In healthy gums the Iodine test is negative. In the enlargement of the gums during pregnancy, the iodine test is positive because of glycogen content. Wade (1965) described a change from simple pseudo clefts to generalized enlargement with pseudo papillae, or occasionally localized pregnancy tumour.

Ziskin and Hotelling (1937) studied incidence of caries in women and found contradictory findings.

Rogers and Keen (1954) believe in demineralization of the alveolar process during pregnancy condition due to the insufficient calcium and phosphorus or vitamin 'D'; to expectant mothers. They regard "Pregnancy Epulis", super imposition of effects of pregnancy on a previously established gingival hyperplasia. These two workers advised for supply of all nutrients during pregnancy and lactation and extra intake of calcium until the 3rd trimester, vitamin 'D' and iron.

Wickham (1952) maintains that there is loss of calcium content of supporting bone, during pregnancy. He does not believe in any change of gingiva during pregnancy if the periodontal tissue is healthy before onset of pregnancy and defines no particular relation to periodontal apparatus.

Although he believes in two states of endocrine imbalance commonly seen in women, which effect the resistance of periodontal tissue and they are steroid group of hormone –

one during pregnancy and other puberty during later's manifestation gingiva remain upset – red, swollen and tender.

Shukers et al (1933) studied metabolism of pregnant and lactating mothers. They found daily caloric intake of three pregnant mothers was 2,200, 2,900 and 2,600 whereas in lactating mothers it increased to 4200, 4500 and 3800 respectively of three mothers under their observation.

Engel (1952) is of the opinion that gingival tissues undergo changes in association with various constitutional states, and the relation between the endocrine and the gingival disease is of great consideration. Papamicolaou (1933) has found the positive results of the sex hormones on vaginal epithelium.

From the animal experiments and human patients, we have come to this point that the hormones, exerted during pregnancy exert and influence the state of gingival tissue, as such physiologically estrogens tend to augment the deposition of glycogen in susceptible epithelia.

Ziskin (1936) has shown the possibility, at least for clinical improvement with gonadotrophins in desquamative gingivitis. They also found promising results with estrogens in atrophic gingivitis. This endocrine activity represents a physiological alteration. During the period of pregnancy there are transient symptoms in the target tissues and patient complain of enlargement of the gums, pain, oozing of the blood from the gums.

It is believed that there are abnormal amounts of water soluble, alcohol, insoluble glycoprotein present in the tissue, which disturbed the synthesis of ground substance and increased activity of nepolymerizing enzymes, or both. Change in the water and electrolyte metabolism implicit the changes in the ground substances.

Doubthwaite (1963), defines estrogens are proliferative hormones concerned especially with the growth and proliferation of the structure of female reproductive tract. They

cause hypertrophy of the urine muscle, during pregnancy. The metabolic effects of estrogens are to cause retention of water and salt in the tissues. The corpus luteum of pregnancy secretes estrogens and progesterone.

Mechanism of Enlargement of Gingiva

Gingival connective tissue consists of cells and components of extra-cellular substance (fibres, tissue fluid and ground substance). The ground substance is largely of glycoprotein (carbohydrate protein) and is believed to be a polymer by its organization at submicroscopic level.

Gresh and Catcepole (1949) proposed that residues arose from enzymatic depolymerization of highly polymerized glycoprotein of ground substance and obviously these enzymes were liberated by the cells of the connective tissue and it is possible that this water soluble material represents an altered secretory activity of connective tissue. It is believed that the changes in connective tissue are due to hormonal influence.

Peral et al (1950) worked on guinea pigs and monkeys for physio-chemical methods and concluded that the connective tissue behaves in such a manner as to indicate presence of negatively charged immobile macro-molecules. Similar response was observed in skin of Monkey under influence of gonadotrophic hormones. His study in gingivae showed the same results.

Administration of sex hormones (estradiol and gonadotrophin) increase in the amount of alcohol insoluble, water soluble carbohydrates. The basement membrane is attenuated and ground substance is reduced.

During hyperplastic states the gingiva contain large amount of water soluble macroprotein carbohydrate which represent water – rich colloid base. In normal

gingival 250 mg. on an average carbohydrate per 100 mg. of dry tissue is available and in inflamed gums its amount exceeds 400 mg . per 100 G. M. of weight.

The electrochemical studies also reveal a difference of the interaction of ground substance colloid with potassium and sodium ions potassium mobility is greater than sodium in water. The situation is highly polymerized and ground substance tends to become reversed. Potassium Ion bears an inverse reaction to the degree of aggravalim of ground substance. Thus selective reaction with cautions implicate the connection tissue in a fundamental role of electrolyte and water metabolism.

Summary

Out of a total of 361 sheep, 95% showed hyperplasia of gums during pregnancy as result of changes in estrogen, 4 cases of pregnancy tumour were also observed.

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