From the First Obstetric Clinic, Charles University, Prague

Placenta as a Lactagogon

By Eva SOYKOVÁ-PACHNEROVÁ, Vlastimil BRUTAR, Berta GOLOVÁ, Eva ZVOLSKÁ

Animals usually have sufficient milk for their young. Internal and external factors may certainly be of some importance, but as far as we know animals suckle their young well and easily – with the single exception of overbred domestic animals in which disturbances in feeding are sometimes observed.

As far as it has been possible to observe mammals in their natural state, it has been found that all – carnivora, herbivora and omnivora – devour their placenta after they have given birth to young. Why do they do this? The explanation, given by some zoologists, that they do it to maintain cleanness, is not satisfying, since there are some mammals to the human mind unclean which also practise placentophagy. Nor can we accept the suggestion that they do it to hide the birth of young. In one word, we do not so far know the reason for placentophagy. Placentophagy is not found only in animals in their natural state; dogs, cats, rabbits and other domestic animals have been quite frequently observed to devour their placenta immediately after the birth of young. Cows after the birth of the calf often show a violent craving for the placenta, and the farmer has to hide it even from cows which have not calved. In this the farmer is following an ancient superstition, which has never been proved scientifically and is to our mind unreasonable, that if the cow is allowed to devour the placenta she will swell or get some other serious gastrointestinal trouble.

Since placentophagy is a phenomenon observed in all mammals in their natural state, we came to the conclusion that the opinions described above are without foundation and that there must be some

connection, so far unknown to us, between placentophagy and some phase of the generative process. It seems quite possible that this connection may concern two things: the involution and restitution of the uterus and the production of milk. Probably our attitude to these two important generative phases has been too organ-bound; we have tried to remedy their dysfunction by means – one-sided uterotonics and especially lactogogues – which were too simple and therefore of little or no use.

We therefore decided that it would be worthwhile studying the effects of placenta administration in women, especially the influence of such administration on lactation. Our decision to try this experiment was made easier by its harmlessness, which has been well proved by zootechnical experience and also anthropologically in certain primitive tribes, occasionally even in civilised mothers. We wanted to help mothers, in those difficult first days after delivery, to overcome a bad start in nursing the baby; we were particularly concerned with those cases in which the enlargement and congestion of the breasts is quite absent and in which almost from the beginning the baby has to be fed artificially. In one word, our aim was to make good nurses of our mothers. Since we did not know the effective substance, we decided to administer the placenta in the same way as it is taken by other mammals, i.e. to give whole placenta per os with as few changes as possible. This of course could not be done literally since it would be a most unusual form of medication; moreover, the volume of the human placenta is relatively large. We therefore had to find some method of conserving the placenta so that the main substances, e.g. proteins and hormones, remained unaltered, and also to find some form in which it could be eaten.

We collected fresh placentae of healthy mothers who were BWR negative and had no trace of TBC in their history. The placentae were ground in a meatmill and transferred as quickly as possible to a drying chamber where they were dried in a vacuum by freezing (lyofilisation). They came back as hard, conglomerated pieces and still could not be used. The dry substance of a placenta weighs 6 ½ g., which is not much in weight but in volume it is rather large. Tabletisation did not seem appropriate since it would have meant more difficult resorption and moreover, the process of tabletisation would have involved rewetting the substance for some time and then drying it again under at most 53° C. We therefore decided on nebulisation. The mother must receive 100 nebulae the size of a large harburn in

order to have the equivalent of one placenta, and of course these must be taken as quickly as possible, within at most 2 days. We called our preparation Lactofer in order to disguise its origin. The women were very patient and ate Lactofer without grumbling, particularly those who were afraid that they would have no milk. There were no secondary symptoms, no gastrointestinal nausea; on the contrary, some mothers rather liked the medicament, they said that they felt fine after using it and that it left a sweet taste in the mouth. We did, however, consider other more agreeable forms of administration, e. g. with chocolate as vehiculum. But we returned to the nebulae because the quantity of chocolate required, 250 g. or ½ lb., was found to be too satisfying. Some mothers emptied the nebulae into water or milk and drank them, others took them mixed with honey.

TABLE 1

The Results of Placenta Administration in 210 women

	Number of cases	Results		
		Negative	Good	Very good
Primiparae	132	13 (9.8%)	71 (53.8%)	48 (36.4%)
Multiparae	78	16 (20.5%)	46 (59.0%)	16 (20.5%)
Total	210	29 (13.8%)	117 (55.7%)	64 (30.5%)

So far we can report on 210 women who ate placenta: 71 with very good results, 110 with good, and 29 with negative results (Table 1). Very good we call those results in which there is considerable increase, both subjective and objective, in size and tenderness of the breasts and in secretion of milk (30 g. and more for one feed); the milk also flows by itself. Good results are those in which the quantity of milk increases by at least 20 g. for one feed. In evaluating these results we of course make allowance for the physiological increase in milk during the first days after delivery. It should be borne in mind that the women who received this treatment were those in whom some trouble in nursing was anticipated: women with flat or unglandular breasts or multiparae who after previous deliveries had nursed badly or not at all.

Some of the cases may be briefly mentioned:

L. V., 18 years. I grav. I para. Flat breasts with small glands and no congestion. She started taking nebulae on the third day after delivery. Two days later there was

marked hardening and enlargement of the breasts and the quantity of milk increased from 30 g. to 50 g., 60 g. and 100 g. for one feed. She was satisfied, felt well and had "a sweet taste in the mouth".

M. A., 24 years. I para, II grav., breech position. She had very flat breasts with only small glands. She received nebulae immediately after delivery and the breasts swelled so much that she developed a temperature and we had to ease congestion with compresses and reduction of fluid intake. Afterwards she had abundant milk and nursed her baby till the normal time of weaning.

T. G., 28 years. II grav, I para. Ten days after delivery she developed diarrhoea, the milk disappeared and nursing was in danger. Four days later she started taking nebulae, finished the dose in 3 days and from then on nursed her baby without difficulty. Satisfied.

M. K., 25 years. II grav. II para. She had not been able to nurse her first baby at all. Nebulae were given immediately after delivery. The breasts showed a marked reaction but there was no milk. The following day, after application of compresses, the breasts were again soft. She took a further 15 nebulae. A new reactive swelling but still no secretion. Evidently faulty milk-ducts.

B. K., 39 years. I grav. I para. She was delivered on September 1st by Breuss forceps. On October 4th she came to the obstetric clinic stating that she had lost all milk. She received the usual dose of nebulae and reported afterwards that when she had finished the breasts swelled rapidly and the milk flowed of its own accord. In her case results were so good that she had gone to town with soft breasts, the breasts swelled so much during the walk that the milk soaked her dress and she had to hurry home.

J. M., 20 years. I grav. I para. Weak breasts without secretion. On the third day she started eating chocolate. On the day on which the dose was finished the breats swelled so much that the milk flowed.

F. V., 32 years. III grav. III para. She had nursed her first two babies badly and only for a short time. On the third day after delivery she started taking Lactofer and at the control visit 2 months later we found that she was still nursing her baby fully.

M. D., 46 years. I grav. I para, sectio caesarea. She started taking Lactofer on the fourth day. The quantity of milk increased form 10–20 g. to 40–60 g. per feed. Eight weeks later, at home, she was only able to nurse her baby by half herself and she came back for a further dose of Lactofer.

One of the present authors also tried Lactofer on herself 2 months after delivery. The quantity of milk increased by 20–30 g. per feed and remained at this level.

Our experiences so far may be summed up as follows:

(1) The women swallow the nebulae without difficulty.

(2) The enlargement of the breasts is without question and usually starts at the earliest 2 days after the full dose of nebulae has been taken.

(3) Secretion of milk starts in the same way as after normal enlargement of the breasts, after about 24 hours.

(4) It depends on the woman herself whether the quantity of milk is maintained at the same level by the correct treatment of the breasts.

An experiment with cows is being carried out simultaneously at the state farm in Losiny and Rapotin. Definite results are not yet available but according to a preliminary report it appears that cows which devour their placenta after the birth of the calf yield one liter of milk a day more than those which do not have access to the placenta.

II.

How can we account for this effect of lyofilised placenta administered per os? The problem may be resolved into three questions:

(1) Are the effective substances proteins, which make up the main part of the firm placental substance?

(2) Does the lyofilised placenta act as a biogenic stimulator (tissue therapy per os)?

(3) Could the lactogenous influence be ascribed to the placental hormones?

Methods

Ad (1). A large quantity of beef was treated in exactly the same way as the placentae. The resulting preparation was called Lactofer II as opposed to Lactofer I produced from placentae. Lactofer II was administered in the same way as Lactofer I, the mothers receiving the preparation during the first 4 days after delivery. They mixed the pulverised meat with water, tea, milk, coffee or honey and consumed the prescribed amount in 48 hours. Since the average weight of one placenta is 65 g., we gave 65 g. of dried meat as one dose. We gave the powder to the mothers in the same way as Lactofer I, with the same explanation, so that if the effect were psychological it would be the same with both preparations.

We gave Lactofer II to a total of 27 mothers, 13 primiparae and 14 multiparae. With all 27 mothers we expected bad or no milk secretion so that the choice of patients was the same as with Lactofer I. We lost sight of 6 of these 27 mothers, so that only 21 mothers, 11 primiparae and 10 multiparae, can be considered here.

Ad (2). This question could be investigated by the same method as we used to find out whether proteins were the effective substance (administration of Lactofer II).

Ad (3). In 20 women who received placenta to increase their milk production, we controlled the level of pregnandiol in the urine during the first days after delivery (148 examinations). The mothers were given Lactofer I during the first 4 days after delivery and the level of pregnandiol was controlled until they left the clinic.

TABLE 2

The Results of Lactofer II Administration

	Number of mothers	Results	
		Positive	None
Primiparae	11	3	8
Multiparae	10	4	6
Total	21	7	14

Analysis

Ad (1). In 3 primiparae out of the 21 mothers (10 multiparae, 11 primiparae) the medicament appeared to have a positive effect on the quantity of milk. In 8 there was no result at all. Four of the multiparae stated some improvement, 6 showed no result. In all, one third of the mothers stated that the preparation helped them, in the remaining two thirds it had no effect at all. A positive result is one which we would put into columns 2 and 3 in Table 1.

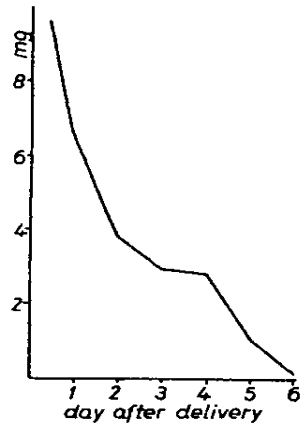
Ad (3). On the average pregnandiol disappears from the urine on the 5th–6th day after delivery. (The urine was examined for pregnandiol by the method of *Watteville-Huber*, modified in our laboratory by *Málek*.)

Discussion

Ad (1). The effect of Lactofer II is very different from that of Lactofer I. Both preparations were made up in the same way with as little alteration as possible to the fundamental materials, mainly the proteins. The method of administration was also the same, both preparations being given as far as possible over the same period of time and accompanied by the same explanation. A positive result was observed after Lactofer I in 86 %, after Lactofer II in 33 % of cases. In addition, more than a third of the successful 86 % showed such a strong reaction to the treatment that we marked the result +++, whereas in the group receiving Lactofer II there was no case

TABLE 3

Excretion of pregnandiol in the urine of women after delivery, who ate lactofer I., in mg/24 hrs.



of a surprisingly over-average secretion of milk. Somehow, of course, this positive reaction to Lactofer II must be explained. It may after all be due to the high quality protein content of the preparation. *Richter's* experiment with rats seems to confirm this. The rats, in separate groups, were fed 11 different substances: proteins, sugar, fats and various minerals. The rats were (1) normal, healthy, (2) pregnant and (3) in lactation. During lactation the rats showed increased appetite for proteins and fats, whereas their appetite for sugar remained the same as in those pregnant. Of course when the rats were saturated with proteins and fats they required from then on only as much of these substances as they did when pregnant.

There is a further possibility which must be taken into account for both medicaments in a certain number of women: this is the psychological influence which administration of any medicament would have on women in their condition. The psychological influence may have played a considerable part in the 33 % successful results in the group receiving Lactofer II. Further, there are of course women in both groups who would have nursed their babies satisfactorily even without any medication, though we tried to choose women for the experiment in whom bad nursing might be expected.

The positive result in 33 % of the women receiving Lactofer II cannot, in our opinion, be ascribed to an effect of the medicament itself; proteins, therefore, are probably not the important part of the dried placenta which causes the increase in milk secretion.

Ad (2). The next question that arises in looking for the effective substance of dried placenta is whether placenta administration may be explained as some sort of tissue therapy applied per os. The theory of tissue therapy is generally known today. According to *Filatov* animal and herbal tissues undergo biochemical alteration when separated from the organism and subjected to the influence of unfavourable surroundings. At the same time substances are formed in the tissues which stimulate biochemical processes. These substances enable the tissue to sustain life under difficult conditions and *Filatov* called them substances of resistance or, in view of their origin, biogenic stimulators. Biogenic stimulators, introduced into the organism in one way or another, activate life processes, increase cellular metabolism and intensify the physiological functions of the organism. Low temperature and multiplied traumatisation are important factors causing the formation of biogenic stimulators. Biogenic stimulators are not proteins nor ferments and they are not specific. According to *Filatov* their formation under the influence of unfavourable surroundings is a common law.

Theoretically it seemed that the theory of tissue therapy might be taken as a basis for explaining the action of lyofilised placenta. The placenta is animal tissue separated from the organism; it suffers multiple traumata, is preserved at low temperature and is therefore equipped with the substances of resistance when administered to the organism. In the organism it has to activate life processes, increase cellular metabolism and intensify physiological functions. The unfavourable conditions necessary for the formation of biogenic stimulators are represented in the preparation of the placenta by multiple traumatisation and low temperature (the placentae are ground in a meatmill and then stored in the refrigerator at a temperature of 4° C. and finally lyofilised, i. e. dried in a vacuum by freezing). Biogenic stimulators, however, are not specific, neither histologically specific non species specific. Biogenic stimulators of herbal origin act on animal and even human tissues and organisms and those of human and animal origin act on herbal organisms. If therefore the effect of placenta administration may be ascribed to the presence of biogenic stimulators, we would expect Lactofer II, consisting of beef treated in exactly the same way as the placentae, to act just as favourably on lactation as Lactofer I. We have shown above, however, that this is not the case.

Ad (3). The third question concerns hormones and their possible

lactogenic effect. For technical reasons the easiest method for us was to start measuring the level of pregnandiol in the urine of women taking placenta after delivery. Moreover, it seemed probable that pregnandiol, as the product of progesteronic hormone secretion, would be the first substance to indicate changes. According to the results stated above the level of pregnandiol does not change after the consumption of placenta. The lactogenic effect of placenta taken per os cannot therefore be ascribed to a change in the level of progesterone. This conclusion is confirmed by the results of *Folley* and *Kon* who measured lactation in rats by the growth of their young and found that administration of 1 mg. progesterone to the mother for 12 consecutive days had no influence on lactation.

Hormones of the progesteronic series are not the only sexual hormones which must be considered in investigating this problem. There have always been many authors who regard the placenta as an organ of inner secretion. In 1931 *Collip* et al. published their study on placental hormones. They discovered that in an acetone extract there are two basic substances: a fraction soluble in alcohol (emmenin) and one which is not soluble. Emmenin acts per os and causes the appearance of oestrus in immature rats. Of special interest in recent years have been the publications of *Clauberg* (1937) and *Haupt* (1953). *Haupt* observed hens fed ground placenta and noted any specific influences. He found that the number of eggs did not increase but rather the contrary and also that the eggs were not fertilised. The cock, while picking placenta, appeared to be remarkably lethargic. Histologically it has also been possible to demonstrate an influence on placental hormones on predisposed organs. The experiments of *Hohlweg*, who uses placenta in practice for producing capons, and those of *Schröder*, who implanted placental tissue subcutaneously into the backs of mice, are in accordance with the observations of *Haupt*.

Conclusion

The result of all these experiences, our own and those of other authors, is that future investigations into the effect of Lactofer will have to be concerned not with proteins and biogenic stimulators but with hormones. The fact that the effective substance has no connection with the progesteronic hormones only diminishes the choice of inquiry, so that it now remains to investigate the secretion of other hormonal series. We have already started examining 17-ketosterones

in the urine of women who received placenta after delivery. The results so far seem to show a change as compared with the findings in women not treated with Lactofer. These preliminary results are also in agreement with the experiments of *Collip* on rats and *Haupt* on hens.

Summary

An attempt was made to increase milk secretion in mothers by administration of dried placenta per os. Of 210 controlled cases only 29 (13.8 %) gave negative results; 181 women (86.2 %) reacted positively to the treatment, 117 (55.7 %) with good, and 64 (30.5 %) with very good results. It could be shown by similar experiments with a beef preparation that the effective substance in placenta is not protein. Nor does the lyofilised placenta act as a biogenic stimulator so that the good results of placenta administration cannot be explained as a form of tissue therapy applied per os. The question of a hormonal influence remains open. So far it could be shown that progesterone is probably not active in increasing lactation after administration of dried placenta.

This method of treating hypogalactia seems worth noting since the placenta preparation is easily obtained, has not so far been utilized and in our experience is successful in the majority of women.

Zusammenfassung

Es wird ein Versuch beschrieben, die Muttermilchsekretion durch Applikation getrockneter Plazenta per os zu steigern. Bei 210 kontrollierten Fällen ergaben nur 29 (13,8 %) negative Resultate, 181 Frauen (86,2 %) reagierten positiv auf die Behandlung, 117 (55,7 %) mit gutem und 64 (30,5 %) mit sehr gutem Resultat.

Es konnte in ähnlichen Versuchen mit einem Präparat von Ochsenfleisch gezeigt werden, daß die wirksame Substanz in der Plazenta nicht Protein ist. Das aufgearbeitete Plazentarextrakt wirkt auch nicht als biologischer Stimulator, so daß die guten Resultate der Plazentarverabreichung auch nicht als eine Art von peroraler Gewebetherapie erklärt werden können.

Die Frage des hormonalen Einflusses bleibt offen. Bis jetzt konnte gezeigt werden, daß Progesteron wahrscheinlich nicht an der Steigerung der Milchsekretion nach Verabreichung getrockneter Plazenta beteiligt ist.

Diese Methode zur Behandlung der Hypogalactia scheint doch erwähnenswert, umsomehr, da das Plazentarpräparat leicht hergestellt werden kann. Sie wurde bisher nicht gebraucht und war in unseren Versuchen bei der Mehrzahl der Frauen erfolgreich.

Résumé

Les auteurs constatent que l'administration après l'accouchement de placenta lyofilisé augmente nettement la sécrétion lactée. Les causes de cette activité sont analysées: haute teneur en protéïnes? Stimulation biogénétique (thérapie tissulaire per os)? Action des hormones placentaires?

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Author's adress:
Dr. *Eva Soyková-Pachnerová*, Dr. *V. Brutar*, Dr. *Berta Golová* and Dr. *Eva Zvolská*, I. gynaek. klinika, U nemoonice 2, *Praha* 2, (C.S.R.)