

Study on Parturition Inducing Techniques in Rabbits

Gu, zilin

(Mt. District Research Institute of Hebei Agricultural
University, Bao ding, China)

Abstract

Four methods are integrated to induce parturition in rabbits. The first is hair pulling, in which hairs around the teats of the female rabbit are pulled out. Secondly, Milk sucking, in which the female rabbit is sucked by 5-8 heads of newborn rabbits, 5-8 days old, for 3-5 minutes. The third one is massage, where half or one minute massage is applied to the abdomen of the recipient, and fourthly attention, good attention is paid to both the adult and the youngs. Parturition was induced with the four methods in 102 rabbits, of which 97 gave response successfully, i.e. the efficiency rate of parturition inducing was 95.1%. The process of parturition was begun 3.7 minutes after inducing. It seems that rabbits with shorter gestation (30 or 31 days) response more quickly (3.00±1.08, 3.08±1.59 min respectively) than those with longer gestation (32 or 33 days, response time 4.10±3.79min, 6.00±4.06 min respectively). The living percentags of the induced newborn is 95.92%, seven per cent higher than that from natural parturitions. The result of this study suggests that the proper gestation at which parturition is induced be 30 to 31 days. The longer the parturiton the lower the efficiency rate, and the living percentage of the newborn will be smaller. The living percentage of the newborn rabbits can be increased by application of

these techniques, especially during cold seasons.

Keywords: Female rabbit; parturition inducing; neural-humoral regulation; living percentage of newborn

Rabbit has the characteristics of many-embryo and high breeding rate. The survival rate of young rabbits is influenced, because the time of parturition is mainly at night, and the terms of farrowing are not regular (from 29 to 34 days). If attention is not paid to both the female and the young in time, the young are farrowed to out of the nest and death for frozen and starved or drowned. Those females of maternal instinct bad and first parturition especially in the winter. It was reported that according to a Chinese Youth Newspaper, June 3, 1990, the methods of parturition inducing in rabbits applied by Lu Zhanqing. We used the methods for reference and further studied and have got a results preliminary. Report as follows.

Materials and Methods

1 Materials: The rabbits healthy of gestational period for over 30 days (include 30 days) were selected as test, the females parturing naturally same time were selected as control.

2 Methods: Going to four rabbits farms not regular, all of the rabbits according with the conditions were selected as test. Four methods are integrated to induce parturition. The first is hairs pulling, catching the gestational rabbit and put on a smooth and keeping quiet and lie supine. The hairs around the teats of the female rabbit is pulled out handfuls with thumb and forefinger. Secondly, milk sucking, in which the female rabbit is sucked by 5-6 heads of young rabbits, 5-8 days old, for 3-5 minutes, under the artificial control. Thirdly, massage, where half or one minute massage is applied to the abdomen of the rabbit with hand

sterilized. Fourthly, attention, good attention is paid to both the adult and the youngs.

Test Results

1. Effects of survival rate of newborn in parturition inducing

Parturition was induced successfully in 97 rabbits (Angla 59 rabbits, meat-type 38 rabbits), producing young rabbits 612 heads and living young rabbits were 587 heads, survival rate was 95.92%. The natural parturitions same time were 114 rabbits, getting young rabbits 1272 heads, the living young rabbits were 1132 heads, survival rate 88.99% ($p < 0.01$) as table 1.

Table 1. Statistical table of the survival rate of newborn in parturition inducing

Item	Type	Number of fetus	Number of youngs	Number of living youngs	survival rate
Angla	Inducing	59	382	315	96.04 **
	Natural	88	499	432	84.77
Meat - type	Inducing	38	284	272	95.77 *
	Natural	103	773	709	91.72
Sum	Inducing	97	612	187	95.92 **
	Natural	191	1272	1132	88.99

Note * p<0.05 ** p<0.01

2. Effects of parturition inducing different gestational periods

The total amount of parturition inducing was 102 rabbits, and success was 87 rabbits. Among the 5 rabbits of not success, one was 31 days gestational periods, farrowing 4 heads again after parturition inducing, two were 32 days gestational periods, one was farrowing 4 heads (1 death fetus) after parturition* inducing 4 h, another was n't farrow, 2 heads expediting with hormone, all of death fetuses. Two were 33 days gestational periods, all of death fetuses.

Table 2. Effect of parturition inducing different gestational periods

gestational periods	number of fetuses	number of success	success percentage	time from inducing to farrow	number of youngs	living youngs	survival rate
30	20	20	100	3.00+1.08	141	138	97.87
31	38	37	97.33	3.09+1.59	243	236	97.12
32	31	29	93.55	4.10+3.79	169	161	95.27
33	13	11	84.62	6.00+4.00	59	52	88.14
Sum	102	87	85.10	3.70	612	587	95.92

Discussion

1. Mechanism. The parturition of females is a complicated physiological process controlled by oxytocin, which the secretion of oxytocin is regulated by nervous system [2]. Oxytocin also participates

in milk ejection, a complex reflex composed of conditioned and unconditioned reflex [2]. The reflex arc of unconditioned reflex is from the receptor of udder to supraoptic and paraventricular nucleus, the basic nerve centre for milk ejection, via n. spermaticus externus, medulla spinalis and medulla oblongata. The milk ejection has two efferent ways, one of ways is hypothalamus - hypophysis - body fluid which regulates the milk ejection. Posterior pituitary controlled by central nervous system secretes oxytocin to blood reflexly. Oxytocin leads to milk ejection of mammary gland and systole of uterine smooth muscle.

The regulation of parturition - induced can be divided into two phrases: first, young rabbit's nursing stimulates the receptor in teat, reaches the centre of milk ejection via afferent nerve, leads to the secretion of oxytocin by pituitary reflexly, the systole of uterine smooth muscle and strengthening of the action between fetus and uterus. Second, massage can induce the movement of fetus and uterus and enable the fetus falling back under the action of oxytocin. The dilatation of uterine cervix and vagina results in oxytocin secretion reflexly. With the help of powerful contract of uterine, fetus is born quickly.

2. Time. Table 2 shows that the success rate of parturition - induced intended to be decreased from 30 to 33 days pregnancy, but had no significant differences between 30 -32 days pregnancy. The time from inducing to parturition also intended to be prolonged, standard deviation was increased. The survival rate was similar, but decreased significantly on 33 days.

According to author's investigation, dam's average pregnancy period was 30.8 days (29 -34 days). Generally, the shorter pregnancy the more litter size; on contrast, the fewer litter size the longer pregnancy. The pregnancy period of primiparous dam was shorter, older was longer and robust was in the middle, but when pregnancy period was above 32 days,

the still birth rate increased [2]. This experiment had proved that prolonging pregnancy period reduced the dam's susceptibility to parturition - induced. Therefore, parturition - induced between 30 and 31 days pregnancy was the best.

3. Method. According to the experiment made by lu zan qing, after the hairs were pulled up, young rabbits began nursing, dam partused in half hour. We used the same method and found that farrowing interval was longer, the rate of success was lower. Repeated experiments showed that the better effects for four methods integrated to induce parturition had been achieved. After the dam's hairs was pulled up, young rabbits used at the age of 5 ~ 8 days old (5 ~ 6 heads) began to nurse immediately. Because the young rabbits(<3 days old) surking were weak or shorter, they could not induce parturition effectively . The strong force of sucking of the older rabbits (after 12 days old)destroyed the teat (hyperaemia and haemorrhage etc .). 3 ~ 5 minutes sucking for young rabbits was fairly good, which was equal to the natural sucking time. This experiment proved that parturition could n't be induced below 3 minutes sucking. longer sucking led to no milk in milk pool, the dam became restless (sometimes dam parturied during nursing) and had bad influence on nursing of newborn. In order to stimulate that dam's uterus and fetus, start the contract of uterive and the motion of felus, the dam's abdominal cavity was massaged after the gonging rabbits nursed. Under the action of nerve - body fluid, dam's parturition accelerated.

4. Season. From preliminary observation, the parturition - induced had a seasonal differences. The effect was good in winter, spring and autumn, but relatively poor in summer. The reason was not clear.

5. Practical implications. There was a important significance with parturition - induced that interfered dam's physiological state and achieved parturition in a time fixed in rabbit production. First, to control parturition on daytime and increase the survival rate of young rabbits. Second, to concentrate dam's parturition, attain breeding and parturition in the same time and practise intensive production. Thirdly, to control special dam's pregnancy not too long, decrease stillborn foetus, nurse the dam that had a poor maternal instinct and bad habit and reduce unexpected losses. Fourthly, to save a lot of trouble for stockman to nurse the dam by hight and raise labour efficiency.

6. Matters needing attention. The findings in this research point to the fact that although young rabbits sucked maternal milk during parturition - induced, the dam's mammary regulated by nerve - body fluid still secreted colostrum for newborn to suck in process of parturition. We didn't find adverse effect on dam and newborn. Parturition - induced was a strong stimulation for dam. Therefore, dam should be natural parturition before pregnancy 31 days except cold winter season. If dam was no parturition on 31 days (daytime), parturition - induced should be carried out in the evening. The programm of parturition - induced must be carried out seriously, and the action was gentle, quick and steady. In case the dam hadn't parturition completely once, it was important to give a examination of foetus. The dam after parturition - induced gave birsh to newborn quickly, didn't eat afterbirth and licked amniotic fluid in time. To prevent suffecation and death of frost, artificial help should be carried out.

Conclusions

1. Parturition - induced integrated four methods, i.e. hair pulling, milk sucking, massaging and nursing, caused the dam's parturition at expected time (average 3.7 minutes). The success rate was 95.10%.
2. The effect of parturition - induced was the best between the pregnancy 30 and 31 days. If pregnancy period was prolonged, the success rate decreased, the mortality rate of youngs increased.
3. Parturition - induced had no adverse effect on dam. The survival rate of newborn amounted to 95.92% which was 7.87% higher than that of natural parturition.
4. Parturition - induced increased the survival rate of newborn, lightened the burden on stockman and had an important significance in rabbit production, especially in cold winter season. The advantage of this technique was as follows: operation was simple, effect was reliable and extension and application in production was suitable.

References

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