PAG and progesterone profiles in IVF pregnancy after hormonal stimulation and ovum-pick-up method in cows

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Our goal was:

- to determine the influence of using cows for two different procedures in assisted reproduction on later fertility and possibility to conceive by measuring levels of progesterone and PAG and preforming transrectal ultrasound examination

- to monitor foetal development using ultrasound and measuring the foetuses and making PAG curve

Introduction:

- we can determine pregnancy by presence of corpus luteum on the ovarium and consequently high concentration of progesterone in peripheral circulation and according to ultrasound finding

- presence of alive, vital embryo in development can be proved only by determination of **maternal recognition of pregnancy**

- on the clinical point of view, the monitoring of P4, bPAG or BPSPB may help to detect earlier placental abnormalities and embryonic or foetal mortality

- after ex-vivo embryo transfer, the occurence of embryo defect is very low, close to those obtained after natural mating or artificial insemination.

Material and methods:

Blood samples of 18 cows divided in three groups

1. 6 IVF pregnancy cows after hormonal stimulation and ovum-pick-up method,
2. 6 pregnant cows after AI
3. 6 nonpregnant cows

Blood samples 21 days after fertilization till 40 days for pregnancy diagnosis.

All cows in our experiment had no history of reproductive disturbances or difficult parturations and were3-6 years old.

We analysed:

- level of progesterone at day 21
- level of bPAG at day 21., 24., 30., 35. and 40 - specific curve for each cow
- data about cows and esspecially service interval to exclude possibility that high bPAG originates from previus pregnancy, if service interval was too short
- rectal palpation and transrectal real-time ultrasound with linear probe few times after day 20 and than at day 40, 50, and pregnant cows at aproximatly day 90, 120 and 150.

RIA (progesterone and bPAG)

Cows in 3 groups were:

- Cows carring IVF pregnancy in present investigation ware previously used as OPU/IVF donors after hormonal stimulation with FSH
- 6 cows that stayed pregnant after AI
- 6 nonpregnant cows were not inseminated but are confirmed to be healthy and had ovarial cyclical activity using rectal palpation and ultrasound examination at days 20, 40. and 50 after the parturation

OPU/IVF donors procedure:

Cows carring IVF pregnancy in present investigation ware previously used as OPU/IVF donors after:

- hormonal stimulation with FSH during 3 days with equal doses of Folltropin®-V (Vetrepharm Inc., London, Canada, a total dose: 300 mg NIH-FSH-P1)
- OPU was performed 48 hours after the last FSH injection
- Procedure was repeated 3 times during 8 months in intervals of 60-90 days
- 2 months after the last ovum pick-up session transfer of IVF embryos was performed in these cows

Results:

- cows in control group conceived after A.I.

6-2=4 pregnant cows

- group of cows with IVF pregnancy after hormonal stimulation and ovum-pick-up method

4-3-1 pregnant cow

- all other were confirmed to be nonpregnant

0 pregnant cows

Cows	Pregnant at 1. control	Pregnant at 2. control	Pregnant at 3. control
AI cows	6	4	4
IVF cows	4	3	1
Nonpregnant cows	0	0	0

level of progesterone

below 2 ng/ml nonpregnant cow

2-10 ng/ml pregnant cow

level of bPAG- specific individual curve

increase of bPAG pregnant cows

decrease of bPAG or irregular curve nonpregnant cows

- service interval- level of bPAG decreases in maternal blood 70 days after parturation or embryonal / foetal death.
- We compared all numbered data (progesterone level, bPAG curve, service interval) with results of rectal and ultrasound examination
- We concluded that repeated rectal and ultrasound examination gave the same results as progesterone checking and bPAG curve.

All cows suspected to be nonpregnant were confirmed to be nonpregnant and all cows suspected to be pregnant were confirmed to be pregnant, by all used methods

Conclusions:

IVF pregnancy after hormonal stimulation and ovum-pick-up method in cows carries high risk of embrional death but it is very complex question and we definitely need to preform more research wich includes bigger number of animals and more parameters

We also need closer monitoring of each cow, frequently preformed rectal and ultrasound examination, frequent blood sampling during whole pregnancy and making bPAG curve, which together with progesterone level can be valuable tool in detecting and diagnostics of early embrionic death

Hopefully all together can help to improve success of all methods used in assisted reproduction.

Thank You for attention and time!