RELATIONSHIP BETWEEN PLASMA AMH AT PREPUBERTY AND ADULTHOOD IN SHEEP

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The high between-animal variability in the ovarian response to exogenous stimulation treatments is one of the main reasons responsible for the low efficiency of LOPU-IVP in sheep. At present, Anti-Müllerian Hormone (AMH), which is produced by granulosa cells of preantral and small antral follicles, is a great predictive endocrine marker of the number of available follicles in response to ovarian stimulatory treatments in many species. Recently, we also extended its ability to adult sheep (Reprod. Domest. Anim. 2012, 47(s4):492). While the use of AMH in adulthood is of great interest, it would be even more interesting if it could be determined earlier in life, allowing for a precocious selection of the best future donors for embryo biotechnologies. Therefore, our objective was to define plasma AMH before puberty and to relate it with AMH levels and ovarian responses to FSH in the adulthood in the same animals.

With this purpose, ten Rasa Aragonesa ewe lambs were blood sampled when aged 3, 4.5 and 6 months, and later at the adult age (19 months), at the first session of four repeated LOPU sessions. Lithium heparinized tubes were used and plasma was stored at -20 ºC until assayed for AMH (GenII ELISA kit; Beckman Coulter, France). Before puberty, plasma AMH concentrations increased from 3 to 4.5 months, and then declined at 6 months up to levels similar to those observed later in adults: 370.4 ± 77.7, 519.2 ± 153.3 and 171.1 ± 29.7 pg/ml, respectively (Mean ± SEM; $P<0.1$). At these early ages, strong between-animal variability in AMH was found, with concentrations ranging from 20.4 to 1370.8 pg/ml. Within-animal repeatability in AMH at 3, 4.5 and 6 months was found to be very low (0.21; NS). At the adult age, mean plasma AMH concentration was 201.9 ± 24.1 pg/ml. Within-animal repeatability of AMH at 3, 4.5 or 6 months with AMH at 19 months was close to zero. Relationships between AMH before puberty and AMH or follicle yield after FSH stimulation at LOPUs in the adult age were not significant.

In conclusion, plasma AMH before puberty showed a great variability between individuals and between ages, apparently reflecting chronological differences between animals on ovarian maturity further related with sexual precocity, as we proposed in a previous work. Therefore, a direct relationship with AMH levels at the adult age seems to be uncertain and could not be established for now, as it seems to reflect different physiological situations which require more studies. While in adult sheep circulating AMH determination by a single blood sample prior to FSH treatment was a suitable method for selecting the best oocyte donors, the precocious selection of such animals by AMH sampling at their prepubertal age would not be feasible.

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