

# Association between endometrial cytology and uterine ultrasound findings in postpartum dairy cows

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## Purpose

- To investigate the association between endometrial cytology and uterine ultrasound findings, and their effect on pregnancy.

## Approach

- 16 primiparous and 23 multiparous cows were utilized. On day 25 postpartum:
  - A cytological sample was obtained from the endometrium, using a modified cytobrush, smears prepared, stained and % of polymorphonuclear cells (PMN) assessed (Fig. 1).
  - Quantity of uterine fluid determined by transrectal ultrasound (U/S; Fig. 2).
- Interval from calving to first ovulation and pregnancy status was also determined by U/S.
- Cows were grouped as having low (<8%) or high (>8%) PMN count.

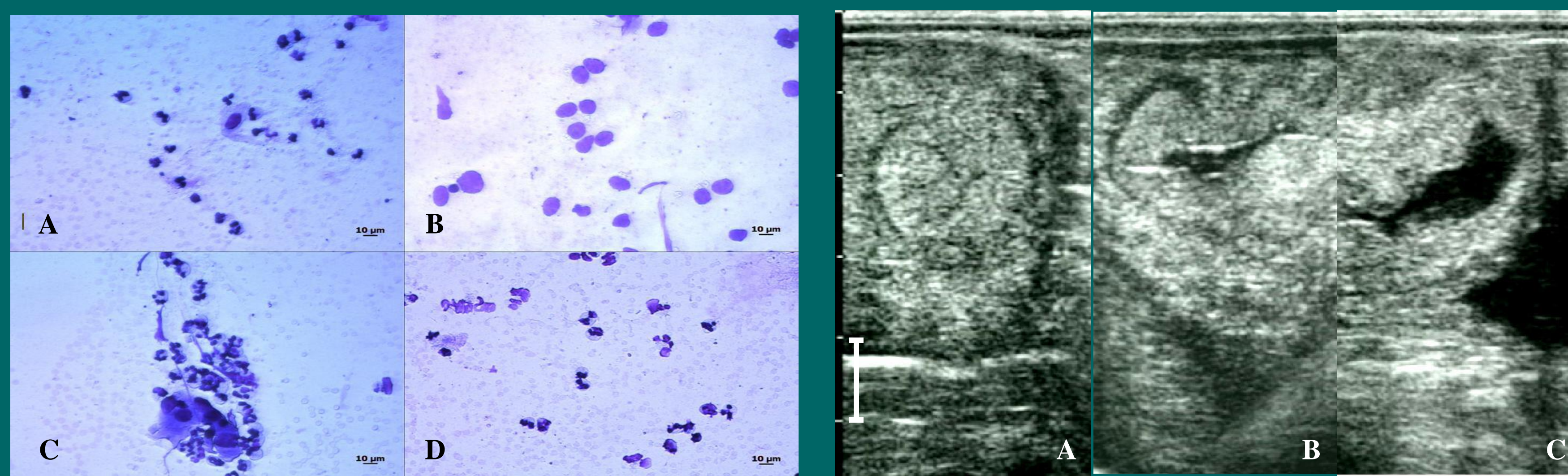


Fig. 1. Photomicrographs of endometrial cytology showing endometrial cells and polymorphonuclear cells (PMN). Samples with a single endometrial cell and several PMN (A), predominantly endometrial cells and no PMN (B), few endometrial cells surrounded by clusters of PMN (C) or PMN only (D).

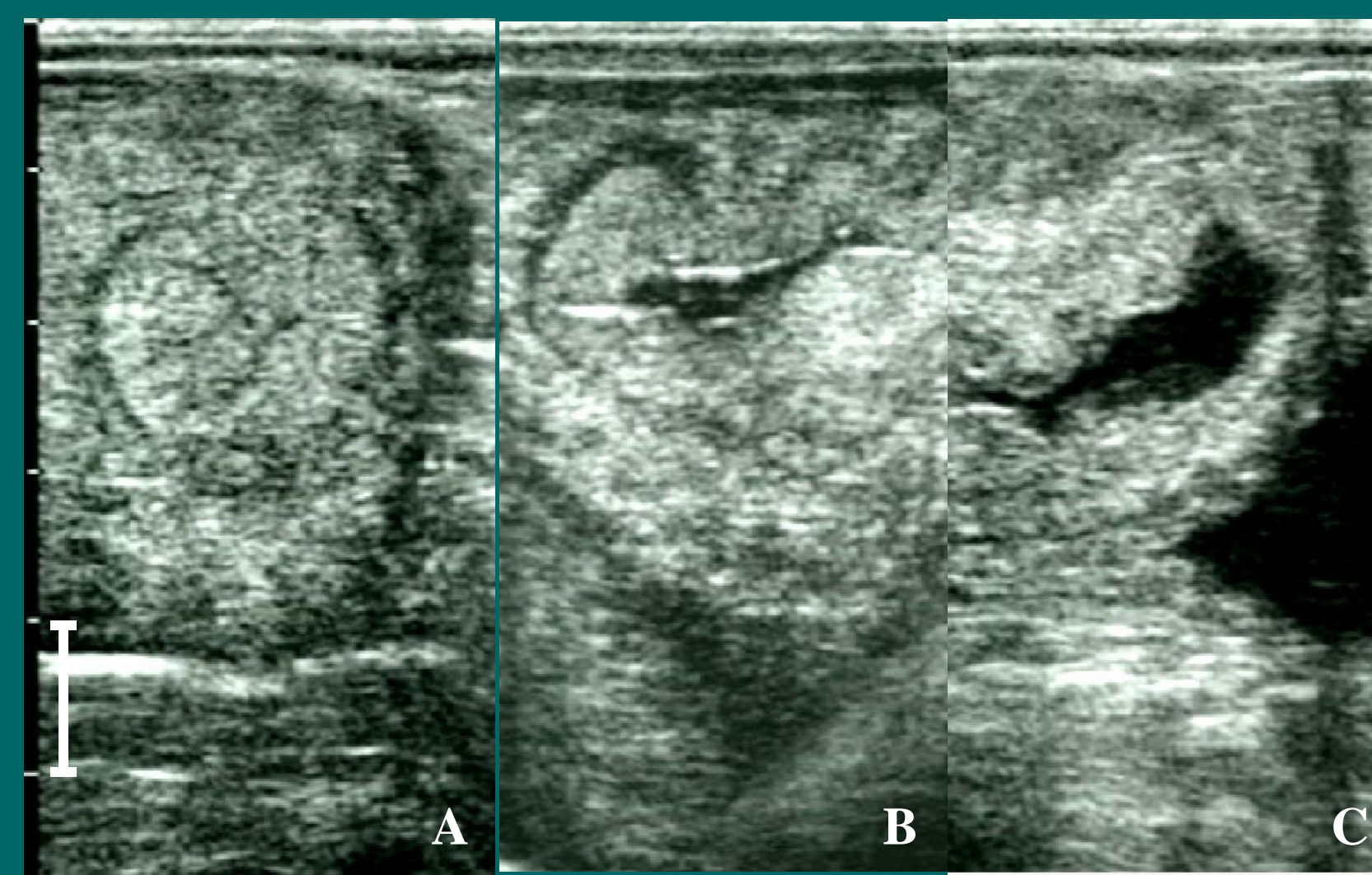


Fig. 2. Ultrasound images of the uterine lumen (black arrows) depicting the three categories of uterine fluid based on lumen diameter (dia): no fluid, dia < 1 mm (A); small volume of fluid, dia 1-5 mm (B); large volume of fluid, dia > 5 mm (C). Scale bar = 10 mm.

## Findings

- 75% of primiparous and 30% of multiparous cows classified as high PMN.
- Cumulative pregnancy at 270 d tended to be higher in high PMN multiparous cows (80 vs 58%).

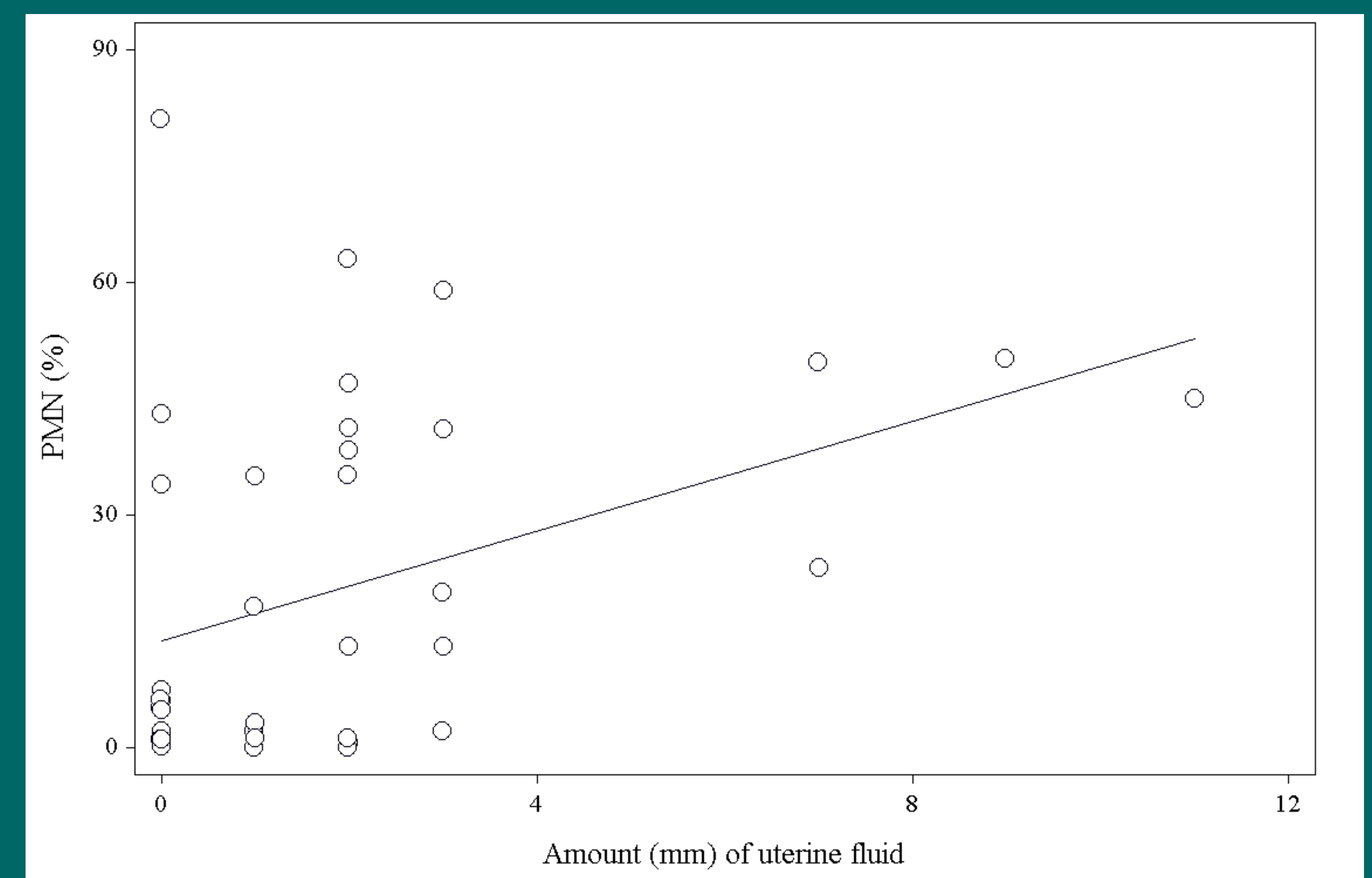


Fig. 3. Positive association between the amount of uterine fluid and percentage of polymorphonuclear cells (PMN). The regression line was  $y = 13.8 + 3.5x$  ( $r=0.41$ ;  $P<0.01$ ).

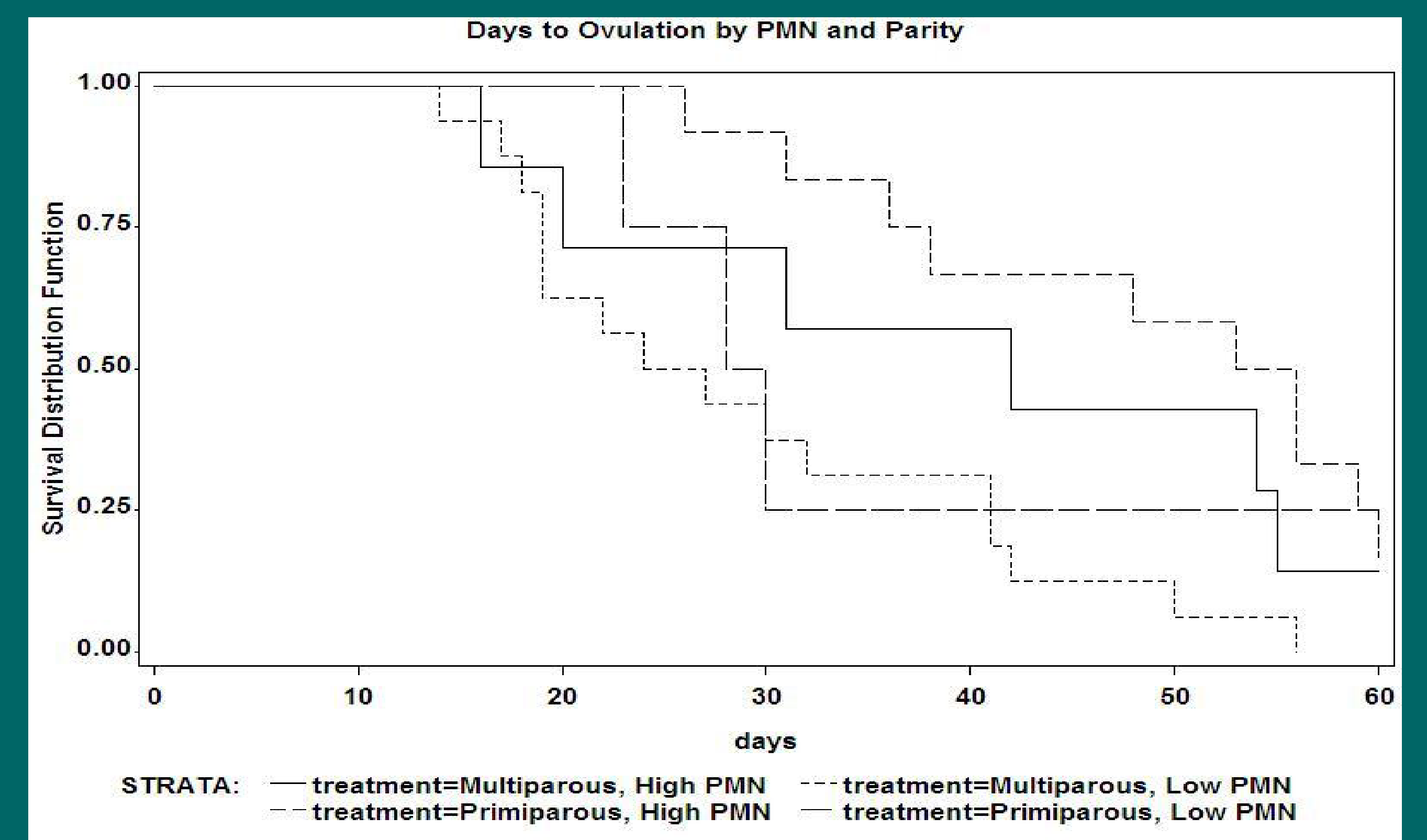


Fig. 4. Interaction between parity and PMN on the interval to first ovulation. Primiparous cows of the high PMN group had a longer ( $P<0.01$ ) mean interval to ovulation ( $48.6\pm 3.6$  d) than those of the low PMN group ( $27.8\pm 1.8$  d). The corresponding intervals for multiparous cows of high and low PMN groups were  $39.0\pm 6.5$  and  $29.4\pm 3.2$  d, respectively ( $P>0.05$ ).

## Take Home Message

- Combining transrectal ultrasonography with endometrial cytology in early postpartum has diagnostic value in the assessment of uterine inflammation.
- Future studies should focus on the relationship between ultrasound findings, parity and fertility.

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