

Monozygotic twinning

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Dear Sir

I previously published a number of research articles on women's reproductive health in a series entitled "Mechanisms of Twinning." In particular, these papers reported a new approach to understanding the role of calcium in monozygotic twinning [1]. The 9-banded armadillo routinely gives rise to monozygotic quadruplets following a diapause between fertilization and implantation. It was concluded that this delay caused the new embryo to be exposed to a reduced calcium environment within the free blastocyst for a prolonged period. As a result, the uvomorulin (a calcium-dependent cadherin), which normally holds the cells of the early embryo bound to each other, is weakened and cell separation is more likely.

In a recent study of polar bears, it has been reported that a similar phenomenon occurs in such animals. Polar bears typically mate in the spring, but implantation is delayed up to 5 months. A genetically

documented occurrence of monozygotic twinning has been identified [2]. The frequency of monozygotic twinning in polar bears is difficult to ascertain because they typically give birth to two or three cubs. However, only one usually survives the first year of life because of the harsh conditions of the Arctic.

In humans, conjoined monozygotic twinning is rare but may also be an example of both twinning and incomplete separation of embryos due to implantation delayed to the second week post-fertilization [3].

References

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3. Steinman G (2002) Mechanisms of Twinning V. Conjoined twins, stem cells and the calcium model. *J Reprod Med* 47: 313-21. [[Crossref](#)]

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