

Menstrual synchronizing: myth or reality?

Abstract

Menstrual synchronizing (MS) represents the temporal correlation of the menstrual cycle debut among women living in spatial proximity. Possible mechanisms underlying some explanations for MS could be the interpolation of various factors of social interaction and/or of some biologic factors (pheromones). The present material aims to review the medical literature in the field. Although seductive as a hypothesis, MS could not be irrefutably proved by any study up until now. Studies attesting MS present important statistical defects which cancel the proof of MS. The analysis of the data obtained by these studies with an adequate statistical apparatus does not allow the demonstration of MS.

Keywords: menstrual synchronizing, menstrual cycle, pheromones, sexology

Introduction

Menstrual synchronizing (MS) represents the temporal correlation of the menstrual cycle (MC) debut among women living in spatial proximity; in order for this phenomenon to exist, a change, at a dyad level, is necessary in the duration of the MC for at least one of the two women and, at a population/group level, a change in the duration of the MC is necessary for a number of women- change which might not exclusively be due to hazard, in other words the change in the duration of the MC in those cases not being due to a physiological variability in the duration of the MC. The phenomenon, if it even exists, might be important if it is interpreted as a mechanism of adjustment to a group (i.e. either a consequence of social communication or of a biological communication like pheromones), rather than as an adaptive modification to an external factor.

Harris and Vitzhum showed that at a mean period of 28 days of the MC, the maximum number of days that can separate the debut of the MC in two women is 14 days, with a mean of 7 days. However, one must take into consideration that the duration of the MC in half of the women reporting "regular" MC has, in reality, an individual variability of 6 days. For this reason, the temporal correlation can occur, virtually, also due to hazard⁽¹⁾. This is why eliminating the risk that this phenomenon is owed to mere hazard is the mainstay for all the studies regarding MS.

Review of the Medical Literature in the Field

The first studies in the medical literature in the field were performed by McClintock and contributors starting in the 70'. In 1971, McClintock et al. analyzed a number of 135 roommates from an academic campus, aged between 17 and 35 years old. They were interviewed at an interval of 3 months regarding the last and penultimate MC, and the social relational pattern was also analyzed, and proximity regarding the debut of the MC regarding roommates was noticed. These

changes were accounted to biological communication, through pheromones, and the results of the study were considered to be an indirect proof of the existence of a significant communication through pheromones between individuals of the human species^(1,2).

A subsequent study from the same authors analyzed a number of 79 women from a university campus and observed an alignment in the debut of the MC among women connected by friendship relationships⁽³⁾.

Russell, Switz and Thompson performed, in the same year, a study in which the participants were applied thrice a month on the upper lip, immediately under the nose, an alcoholic mixture obtained from cotton paddles impregnated with axillary perspiration from other women (each participant received a mixture derived from a single other donor throughout the study), obtaining a reduction in the mean distance between the debut of MC from 9.3 to 3.4 days. The study also had a control group where only alcoholic solution was administered^(1,4).

Wilson, and then Young demonstrated that the statistical device used by McClintock et al. in appreciating the significance in the alignment of the MC is not adequate^(2,3,5,6). Graham et al. observed MS in some groups, but this could not be statistically proven to be due to factors other than hazard⁽⁷⁾. Moreover, Wilson showed, on statistical basis, that in McClintock's study from 1980 the convergence of MC is due to hazard (i.e. pure happening) rather than a biologic phenomenon⁽⁸⁾. Wallis proved a significant alignment of MC in female chimpanzees kept in the same cage versus chimpanzees held in different cages⁽⁹⁾, but Schank showed, in 2001, that the statistical device used in this case was also not valid, and therefore synchronization of the MC cannot be considered a valid one, due to reasons other than hazard⁽¹⁰⁾. The existence of MS couldn't be irrefutably demonstrated in other mammals⁽¹⁾.

Trevathan et al. performed a study on a number of 29 lesbian couples (who did not even occasionally have sex with men), aged between 22 and 48, who lived

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together, considering this group as appropriate for a more adequate testing of MS, since this cohort guaranteed cohabitation, affective relations and, moreover, the interference of male external signals was reduced/excluded. In this cohort, Trevathan et al. showed that a divergence in the MC was more likely than a convergence⁽¹¹⁾.

Weller et al. showed in 1992, on a cohort of 20 lesbian couples, that MS was present⁽¹²⁾. Subsequently however, on this data corroborated with the ones obtained by Trevathan and contributors, they concluded that MS is just apparent^(11,13).

Strassman followed MS in a tribal population, where he observed that MS does not really exist⁽¹⁴⁾, and Yang and Schank observed, in a population of 186 women, a divergence of MC, contrary to all expectations. This last study included women who lived in the common dorms, of 5-8 women per bedroom⁽⁶⁾.

Ziomkiewicz showed in 2006, in a study performed in Poland, in a campus with 18 double dorms and 21 triple dorms, that MS could not be showed and that the most important factors in the differences between MC were body weight and irregularity of the MC for each participant in the study rather than social interactions between participants, as initially expected⁽¹⁵⁾.

Regarding the evolutionary utility of the mechanism of MS, Knight forwarded the hypothesis that menstrual synchronization would increase competition between women in a group, which would lead to the selection of the more fertile ones, and therefore MS would be invested with evolutionary attributes⁽¹⁶⁾. Foley and Fitzgerald showed by using *in silico* simulation, that, if MS existed, women non-responsive to the mechanisms that would generate MS would present an evolutionary advantage, as they would be fertile in the periods of time when the other women in the group, responsive

to the virtual mechanisms that would determine MS, would be the non-fertile period⁽¹⁷⁾.

Acceptance of the Existence of Menstrual Synchronization in the General Population

Possible mechanisms which might underlie some explanations for MS would be the correlation with the Moon cycle, social and biological factors like pheromones. However, there are no other evidence to support any of the hypotheses^(1,18). While up until now there is no clear evidence to support the existence of MS, this is largely accepted in the society. The hypothesis of the existence of MS is seductive in many ways. It could be proof to high empathy in women groups, a connection to the Moon cycles, therefore a possible astral connection⁽¹⁸⁾, or the proof of an ineffable communication between women. The existence of MS could also be a proof of communication through pheromones.

Conclusions

Although seductive as a hypothesis, MS could not be irrefutably proved in any study at the moment. Studies attesting the presence of MS have important statistical vices which annul the demonstration of MS. Furthermore, the analysis of the data obtained from these studies with an adequate statistical device does not allow the demonstration of MS. The lack of proof to support the existence of MS does not attest, of course, the absence of MS, but represents a support for a healthy skepticism in this matter. ■

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References

- Harris AL, Vitzthum VJ. Darwin's legacy: an evolutionary view of women's reproductive and sexual functioning. *J Sex Res* 2013, 50(3-4), 207-46.
- McClintock MK. Menstrual synchrony and suppression. *Nature* 1971, 229, 244-5.
- McClintock, M. K. Social control of the ovarian cycle and the function of estrous synchrony. *American Zoologist* 1981, 21, 243-56
- Russell MJ, Switz GM, Thompson K. Olfactory influences on the human menstrual cycle. *Pharmacol Biochem Behav* 1980, 13(5), 737-8.
- Wilson CH. A critical review of menstrual synchrony research. *Psychoneuroendocrinology* 1992, 17, 565-91.
- Yang, Zhengwei; Schank, Jeffrey C. Women do not synchronize their menstrual cycles. *Human Nature* 2006, 17 (4), 433-47.
- Graham CA, McGrew WC. Menstrual synchrony in female undergraduates living on a coeducational campus. *Psychoneuroendocrinology* 1980, 5, 245-52.
- Wilson CH. A critical review of menstrual synchrony research. *Psychoneuroendocrinology*, 1992, 17, 565-91.
- Wallis J. Synchrony of estrous swelling in captive group-living chimpanzees (*Pan troglodytes*). *International Journal of Primatology* 1985, 6, 335-50.
- Schank JC. Measurement and cycle variability: Reexamining the case for ovarian-cycle synchrony in primates. *Behavioural Processes* 2001, 56, 131-46.
- Trevathan WR, Burleson MH, Gregory WL. No evidence for menstrual synchrony in lesbian couples. *Psychoneuroendocrinology* 1993, 18(5-6), 425-35.
- Weller A, Weller L. Menstrual synchrony in female couples. *Psychoneuroendocrinology*, 1992, 17(2-3), 171-7.
- Weller A, Weller L. Prolonged and very intensive contact may not be conducive to menstrual synchrony. *Psychoneuroendocrinology* 1998, 23(1), 19-32.
- Strassmann B. The biology of menstruation in *Homo sapiens*: Total lifetime menses, fertility and non-synchrony in a natural-fertility population. *Current Anthropology* 1997, 39, 123-9.
- Ziomkiewicz, Anna (2006). "Menstrual synchrony: Fact or artifact?". *Human Nature* 17 (4), 419-32.
- Knight C. *Blood relations: Menstruation and the origins of culture*. New Haven, CT: Yale University Press, 1991.
- Foley, R., Fitzgerald, C. Is reproductive synchrony an evolutionarily stable strategy for hunger-gatherers? *Current Anthropology* 1996, 37, 539-45.
- Ilias I, Spanoudi F, Koukkou E, Adamopoulos DA, Nikopoulou SC. Do lunar phases influence menstruation? A year-long retrospective study. *Endocr Regul.* 2013, 47(3), 121-2.