

Occurrence of Preeclampsia Protective Influence from Previous Pregnancy Terminated by Abortion and Absence of the Protective Influence Preconceptional Exposition to Partner's Sperm

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Abstract: The purpose of this study was to verify a hypothesis saying than pre-conception exposition to partner's sperm reduces a risk of preeclampsia outbreak in primiparas. A questionnaire was passed to 261 still childless women, now in 30th week of pregnancy. This questionnaire included questions on a frequency of coitus and method of contraception used, by both present partner and other men before. On the base of these information, we calculated a number of coitus, non-protected by barrier methods of contraception. In addition to that, we were asking about eventual preceding aborted pregnancies. After child-birth, the authors evaluated an occurrence of preeclampsia. Preeclampsia was defined as an occurrence of higher blood pressure, i.e. over 140/90 mmHg, in two different days. This condition was found in 27 women, i.e. 10.34%.

No statistically significant difference was found between a group of women, in which preeclampsia had developed, and a group of healthy women, as for number of coitus without barrier contraception, neither in case of a present partner (210.0 : 231.1), nor in case of other men (114.9 : 69.4). However, the groups differ in a number of preceding aborted pregnancies (We did not distinguish spontaneous and artificial abort), in the case of both – present partner (0.215 : 0.037, $p < 0.01$), and other men (0.219 : 0.037, $p < 0.01$).

The authors conclude, that pre-conception exposition to sperms shows no protective effects on outbreak of preeclampsia in primiparas, the risk of which is reduced considerably by preceding abort, spontaneous or artificial.

Zusammenfassung: *Präeklampsie.* Das Ziel dieser Untersuchung ist die Testung der Hypothese, daß häufigerer Kontakt mit dem Sperma des Partners vor der Konzeption die Häufigkeit des Ausbruchs von Präeklampsie bei Erstgebärenden senkt. Es wurde eine Befragung mit einem Fragebogen bei 261 noch kinderlosen Frauen, die sich in der 30. Wochen ihrer Schwangerschaft befanden, durchgeführt. Dieser Fragebogen schloß Fragen über die Häufigkeit des Geschlechtsverkehrs und die Methode der Kontrazeption ein, sowohl in bezug auf den gegenwärtigen Partner wie auch auf frühere Männer. Auf der Grundlage dieser Information berechneten wir die Häufigkeiten des Geschlechtsverkehrs ohne Kon-

dome oder Diaphragma als Kontrazeptionsmittel. Zusätzlich erfragten wir evtl. frühere Fehlgeburten. Nach der Entbindung wurde die Häufigkeit von Präeklampsie berechnet. Dabei war Präeklampsie definiert als Auftreten von erhöhtem Blutdruck über 140/90 mmHg an zwei unterschiedlichen Tagen. Dies wurde bei 27 Frauen gefunden, d. h. bei 10,34%.

Es konnte kein statistisch signifikanter Unterschied zwischen der Gruppe der Frauen, die Präeklampsie entwickelt hatte, und der Gruppe der gesunden Frauen in bezug auf die Häufigkeit von Geschlechtsverkehr gefunden werden, und zwar weder in bezug auf den gegenwärtigen Partner, noch in bezug auf andere Männer. Doch unterschieden sich die Gruppen hinsichtlich der Zahl vorangegangener unvollendeter Schwangerschaften (wir unterschieden nicht zwischen spontanem und künstlichem Abort), sowohl in bezug auf den gegenwärtigen Partner (0,215:0,037, $p < 0,01$), wie auch auf andere Männer (0,219:0,037, $p < 0,01$).

Die Autoren schließen, daß der präkonzeptuelle Kontakt zu Spermien keinen protektiven Effekt auf den Ausbruch von Präeklampsie bei Erstgebärenden hat. Jedoch sinkt die Häufigkeit von Präeklampsie beträchtlich, wenn eine unvollendete Schwangerschaft vorangegangen ist, sei es nun eine Spontangeburt oder ein künstlicher Abbruch.

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Preeclampsia ethiology has not been explained so far, but it seems, that immunologic effects may play certain role in it. We know, that nulliparity is an important risk factor. It is reported, that the pregnancy after 37th week with the same partner effects protectively (Campbell et al. 1985). This protective effects are considerably lower in the case of foregoing pregnancy with another partner (Robillard et al. 1993). In the late seventies, Marti and Herrmann (1977) suggested, that an occurrence of preeclampsia may related to insufficient exposition to paternal antigens in non-protected pro gravid coitus. Klonoff-Cohen et al. obtained the same results in 1989, when comparing the risk of preeclampsia according to different methods of birth control used prior contraception. These findings correspond to the studies carried out by Need et al. (1993), i.e. that an occurrence of preeclampsia is higher in women after artificial insemination by a donor sperms. However, we have to take into account, that all these studies were carried out retrospectively, and that is why, we cannot rely on the results definitely. We were trying to verify these results in a prospective study.

Methods

We were studying 261 childless pregnant women. In the 30th gestation week (29th to 31st) they had fulfilled a questionnaire, under the help of which we estimated an exposition to sperms in the past, prior the existing pregnancy. The questionnaire included the following points:

1. Number of pregnancies – with the same or another partner – and the results of them (spontaneous or artificial abortion, extrauterine pregnancy).
2. Length of sexual life with the present partner and frequency of coitus with the partner.
3. Methods of birth control employed – with the present partner.

4. Length of sexual life, frequency of coitus and methods of birth control with other partners.

On the base of these information, we estimated a number of coitus prior present conception, with the present partner and other partners and a number of coitus, in which the partner's sperms were exposed (i.e. coitus in the time period, when a women had oral contraception (IUD was not present in the group of nullipars) or when she was attempted for pregnancy.

(In the same time we collected blood samples in order to identify preeclampsia markers from serum. The results obtained are not the objective of this study.)

After the delivery, we evaluated an occurrence of preeclampsia. Blood pressure 140/90 mmHg or higher, determined by at least two independent measurements in two days was considered as a positive symptom of preeclampsia. These symptoms were found in 27 women out of 261 in total (10.34%). Both groups did not differ in age. In women showing symptoms of preeclampsia the age amounted to 25.56 ± 6.42 years, and in the group of healthy women to 25.50 ± 4.76 years. In both groups we compared exposition to sperms (using t-test and variance analysis) and the history of foregoing pregnancies (the differences in course of foregoing pregnancies, i.e. spontaneous or artificial abortion or extrauterine pregnancy were neglected).

In addition to this, we were trying to find some correlation between the newborn's weight, the history of foregoing pregnancies and exposition to sperms prior pregnancy.

Results

In the group of healthy women an average number of pregnancies per woman with the same partner amounted to 0.215 (standard deviation 0.533), while that in the group of women showing the symptoms of preeclampsia amounted to 0.037 (standard deviation 0.192). This difference is of statistical significance ($p < 0.01$).

In the group of healthy women, an average number of pregnancies per women with another partner amounted to 0.219 (standard deviation 0.533), while that in the group of women showing the symptoms of preeclampsia amounted to 0.037 (standard deviation 0.192). Again, this difference is of statistical significance ($p < 0.01$).

Average number of protected coitus (using barrier methods of contraception, including coitus interruptus) prior pregnancy with the present partner amounted to 280.3 in the women with preeclampsia (standard deviation 360.2), while that in healthy women amounted to 291.5 (standard deviation 368.8). This difference is not of statistical significance.

Average number of barrier-free coitus prior pregnancy with the present partner amounted to 210.0 in the women with preeclampsia (standard deviation 323.2), and in the healthy women it amounted to 231.1 (standard deviation 384.9). This difference is not of statistical significance, but it falls to the trend, in which a hypothesis is expected.

Average number of coitus, in which barrier methods of contraception were employed (including coitus interruptus) with another partner (partners) prior present pregnancy amounted to 206.4 in the women with preeclampsia (standard

deviation 450.3), while in healthy women it amounted to 133.8 (standard deviation 238.0). This difference is not of statistical significance.

Average number of barrier-free coitus with another partner (partners) that the father of child expected, amounted to 114.9 in the women with preeclampsia (standard deviation 302.9), while that in the women with normal blood pressure amounted to 69.4 (standard deviation 224.0). The difference is not of statistical significance.

In addition to preeclampsia, we trying to find some correlation between foregoing pregnancies and coitus (with the same or another partner) and the newborn's body weight. We supposed, that immunologic mechanisms may play some role in both, genesis of preeclampsia and fetal hypotrophy. However, by the variance analysis we have not found any significant effect of the variables under consideration.

Discussion

The results of our study show clearly, that early foregoing pregnancy has strong protective effects against genesis of preeclampsia, i.e. also aborted pregnancy (by spontaneous or artificial abortion) regardless to the fact, whether that pregnancy was with the same or another partner. It is not true, that only foregoing viable pregnancy (Chesley and Cooper 1986), or even only viable pregnancy with the same partner (Campbell et al., 1985) protect against preeclampsia. In this respect, we have to mention a rapid drop of eclampsia occurrence in Czechoslovakia in the sixties (Štembera and Znamenáček 1977), which correlates in time with implementation of liberal law on artificial abortion (1957), and result in rapid increase of these abortions (however, this drop of preeclampsia occurrence was considered as due to improved prenatal care by that time).

As for protective effects of exposition to sperms, our prospective study has not demonstrated it – in fact, these effects are not likely. Mills et al. (1991) came to similar conclusions, when he was comparing preeclampsia occurrence in the women using barrier and non-barrier methods of contraception prior conception. Similarly, we were trying to specify number of protected and, first of all, unprotected coitus and to specify the effects in the same and different partners. Also by this way, we have not discovered any protective effect.

Conclusion

Our prospective study clearly demonstrated protective effects of an abortion (both spontaneous and artificial) on genesis of preeclampsia in the ongoing pregnancy, regardless to the fact, that these pregnancies were with the same or another partner. On the contrary, the effects of exposition to sperms (in all partners or to paternal sperms in the case of present pregnancy) prior conception probably do not act as protection against genesis of preeclampsia.

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References

- Campbell D, MacGillvray I, Carr-Hill P (1985) Preeclampsia in second pregnancy. *British Journal of Obstetrics and Gynaecology* 92:131–140
- Chesley LC, Cooper DW (1986) Genetics of hypertension in pregnancy: Possible single gene control of pre-eclampsia and eclampsia in the descendants of eclamptic women. *British Journal of Obstetrics and Gynaecology* 93:898–908
- Klonoff-Cohen HS, Savitz DA, Cefalo RC, McCan MF (1989) An epidemiologic study of contraception and preeclampsia. *Journal of American Medical Association* 262:3143–3147
- Marti J, Herrmann H (1977) Immunogestosis: a new etiologic concept of essential EPH gestosis, with special consideration of the primigravid patient. *American Journal of Obstetrics and Gynecology* 128:489–493
- Mills JL, Kiebanoff MA, Braubard BI, Carey JC, Berendes HW (1991) Barrier contraceptive methods and preeclampsia. *Journal of American Medical Association* 265:70–73
- Robillard PY, Hulsey TC, Alexander GR, Keenan A, de Canues F, Papiernik E (1993) Paternity patterns and risk of preeclampsia in the last pregnancy in multiparae. *Journal of Reproductive Immunology* 24:1–12
- Štemberá Z, Znamenáček K (1977) Rizikové těhotenství a dítě. Avicenum, Praha