

VULNERABILITY FOR MOOD DISORDERS AND AGGRESSIVE BEHAVIOUR IN OFFSPRING OF MOTHERS EXPOSED TO THE TEN-DAY WAR

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BACKGROUND: PRENATAL STRESS

- stressful events during pregnancy → negative impact on health of the offspring
- prenatal stress: stress experienced by the pregnant mother affecting the development of the offspring
- stress hormones are believed to contribute to the biological mechanism underlying the adverse effects of prenatal stress on fetal development and growth (Seckl & Holmes, 2007)
 - programming persistent changes in physiological systems probably via epigenetic mechanism (Babenko et al., 2015; Burton, 2013; Meaney et al., 2007)
 - some effects of prenatal stress are sex specific (Glover & Hill, 2012)

BACKGROUND: PRENATAL STRESS AND HEALTH

... physical health:

- increased risk for cardiovascular disease, obesity, low motor and infant development, epilepsy (e.g. Huizink et al., 2003)
- effects on reproductive functioning in adults

... mental health:

- permanent changes in brain neurotransmitter system → possible increased vulnerability for mental disorders
 - mood disorders (depression, anxiety), schizophrenia, increased abuse of psychoactive substances, behavioural disorders and sleep disturbances (e.g. Bergman et al., 2007; Khashan et al., 2008)

BACKGROUND: STUDIES ON PRENATAL STRESS AND DEFINING STRESSFUL EVENTS

- Such studies are challenging: confounding variables, defining similar exposure of participants to stress, ...
- Previous studies: life events as stressors: psychological trauma, partner's death, job loss, personal injury, disaster experiences, ...
(e.g. Robinson et al., 2009; Dancause et al., 2011; Harville et al., 2010)
- Some events (earthquakes, terrorist attacks, wars) are (more) objectively identifiable in terms of intensity and duration → well-defined stressor
(Graignic-Philippe et al., 2014)

Slovenian Independence War:

- 27th of June – 7th of July 1991; 10 days
- Well-defined, temporally limited stressful event

AIM

Preliminary examination of aggressive traits and mood disorder indices in offspring of mothers exposed to the Slovenian Independence War (comparing them to the offspring of women, pregnant before and after the war)

** the present study is a part of a larger study divided in three parts:

- the psychological study
- the andrological study (reproductive health of males exposed to the prenatal stress)
- the animal models study

METHODS: PARTICIPANTS

3 groups according to the prenatal period in regard to the Slovenian Independence War

Group	Group	Male	Female
	N (% of total N)	N (% of N in group)	N (% of N in group)
Before the war (Control group 1) [1. 9. 1990 – 31. 3. 1991]	172 (21.9 %)	91 (52.9 %)	81 (47.1 %)
During the war (Pregnancy) * [30. 6. 1991 – 8. 3. 1992]	287 (36.5 %)	175 (61.0 %)	111 (38.7 %)
After the war (Control group 2) ** [1. 4. 1992 – 31. 12. 1992]	327 (41.6 %)	210 (64,2 %)	114 (34.9 %)
Total	786 (100.0 %)	476 (60.6 %)	306 (38.9 %)

* Data on gender missing for 1 participant.

** Data on gender missing for 3 participants.

METHODS: INSTRUMENTS

Temperament Evaluation of Memphis, Pisa, Paris and San Diego – autoquestionnaire version (TEMPS-A) (Dolenc et al., 2013):

- cyclothymic (0.97*), depressive (0.97), irritable (0.98), hyperthymic (0.95), anxious (0.97)

Buss-Perry Aggression questionnaire (BPAQ) (Buss & Perry, 1992):

- physical aggression (0.90), verbal aggression (0.98), anger (0.82), hostility (0.99)

Clinical Assessment of Depression (CAD) (Bracken & Howell, 2004):

- depressed mood (0.96), anxiety/worry (0.61), diminished interest (0.75), cognitive and physical fatigue (0.99)

+ questionnaire with demographic information

METHODS: PROCEDURE AND STATISTICAL ANALYSES

- participants recruited from faculties of University of Ljubljana and University of Maribor (from october 2014 to january 2016)
- inclusion criteria: signed informed consent and the date of birth from 1. 9. 1990 to 31. 12. 1992
- ANOVA, bootstrap; post-hoc comparisons: Hochberg's GT2

RESULTS: MALE

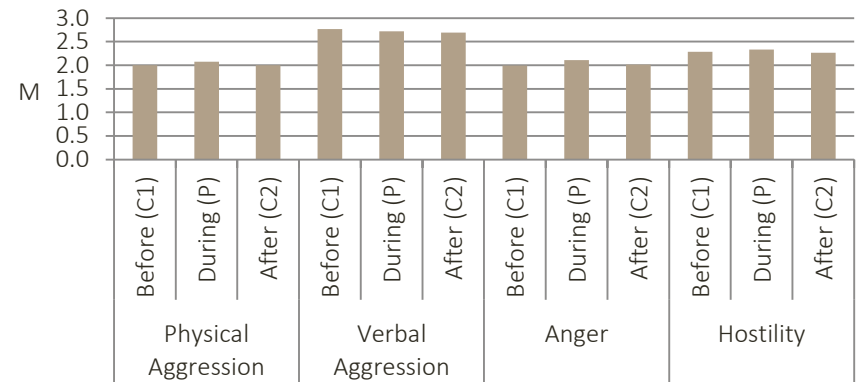
TEMPS-A:

- Depressive $F(2, 444) = 5.547, p = 0.004$
- Cyclothymic $F(2, 444) = 5.556, p = 0.004$
- Anxious $F(2, 444) = 3.976, p = 0.019$

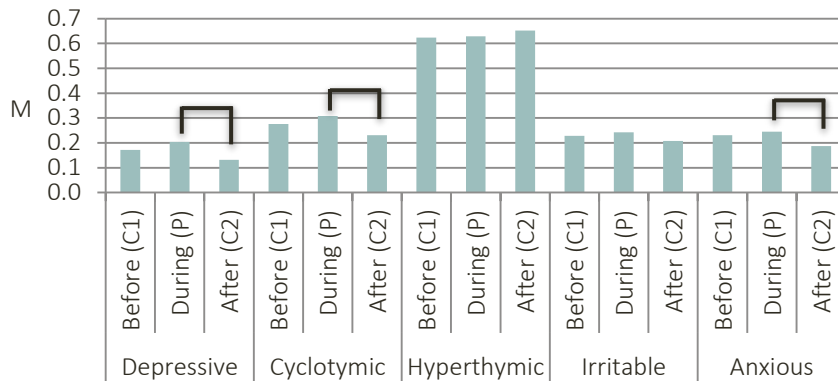
CAD:

- C&P Fatigue $F(2, 287) = 4.389, p = 0.013$
- Dim. Interest $F(2, 287) = 3.244, p = 0.040$

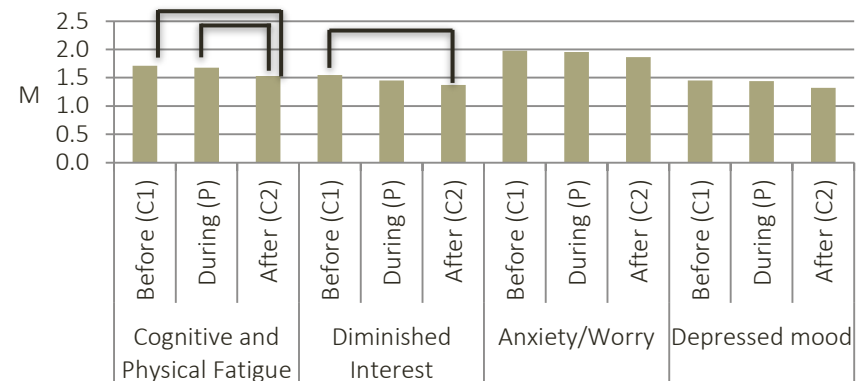
BPAQ (m)



TEMPS-A (m)



CAD (m)

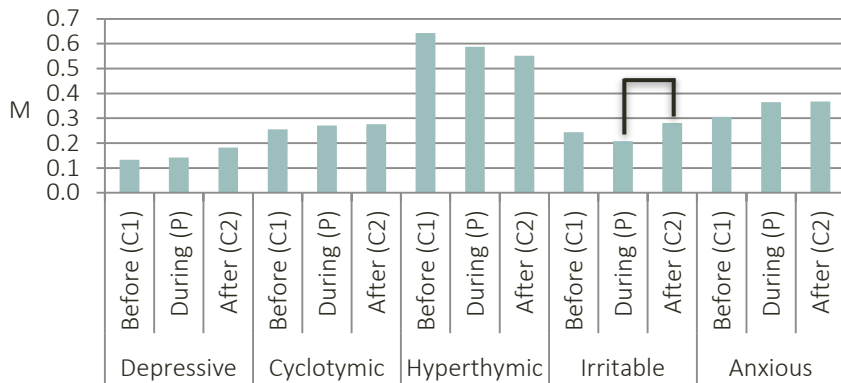


RESULTS: FEMALE

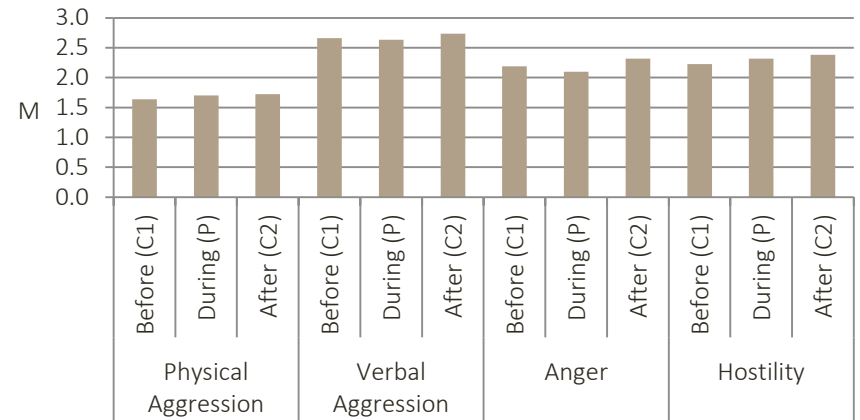
TEMPS-A:

- Irritable $F(2, 286) = 3.228, p = 0.041$
- CAD: $F(2, 283) = 5.093, p = 0.007$
- Anxiety/W

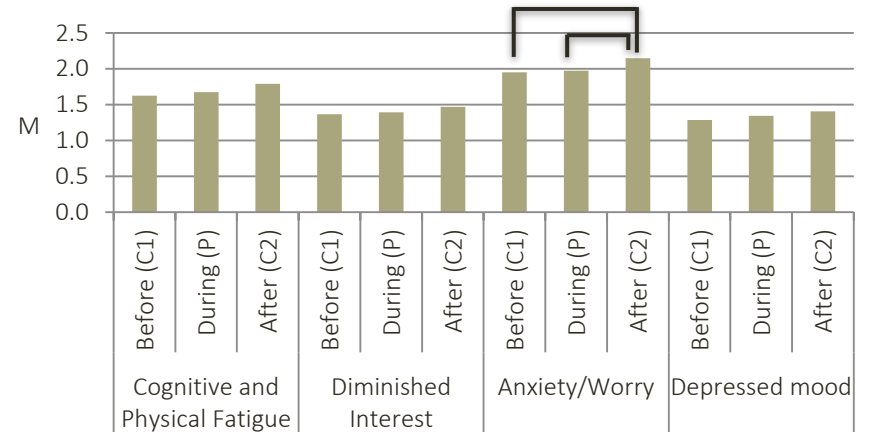
TEMPS-A (f)



BPAQ (f)



CAD (f)



DISCUSSION

- different results in males and females
 - males: group of pregnancy during the war scoring higher than group after the war
 - Depressive, Anxious, Cyclothymic (TEMPS-A), Diminished Interest (CAD)
 - females: group after the war scoring higher than group of pregnancy during the war
 - Irritable (TEMPS-A), Anxiety/Worry (CAD)
 - higher scores for non-exposed group – what happened after the war?
- no sig. difference on subscales of aggression
- fetus not equally vulnerable to external influences in all trimesters
- mothers' perception of stress and other possible stressful events during pregnancy (?)
- controlling for the exposure to war (geographically) (?)

CONCLUSIONS

Further stages of the study:

- linking to andrological data on reproductivity
 - controlling for geographical location
 - analyses by trimesters of pregnancy of prenatal stress exposed group
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- studies of this type are challenging (confounding variables, defining the stressful event etc.)
 - important for understanding the mechanisms and effects of the prenatal stress on behavioural and personality traits → might promote the prenatal stress management interventions for pregnant women exposed to stress (improving their pregnancy as well as the health status of the offspring)

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THANK YOU FOR YOUR ATTENTION!

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