

CHANGES IN CIRCULATING LEVELS OF ADIPONECTIN DURING THE PERICONCEPTIONAL PERIOD

Maternal Child Health Lab

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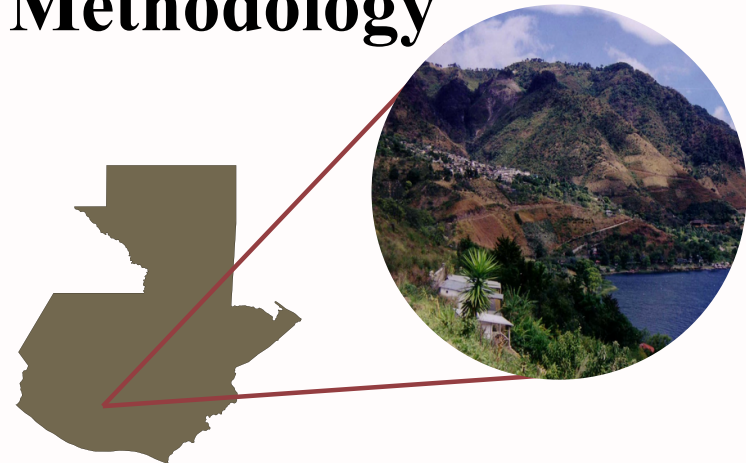


PRESENTER:
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Background

- Annually, about 23 million miscarriages occur worldwide (1).
- The maternal periconceptional period (PCP), defined as 8 weeks pre-conception to 8 weeks post-conception, can influence human embryo development.
- The PCP involves oocyte maturation, fertilization, conceptus formation, and early embryo development (2,3). These processes are energetically demanding, bringing emphasis to the maternal metabolic environment.
- Adiponectin is an adipocytokine secreted by adipose tissue that is strongly associated with adiposity indices and can be used as an indicator of maternal energy status.
- My goal in this study is to analyze adiponectin trajectories from pre-conception to early post-conception and to understand how it can affect pregnancy outcomes.

Methodology



Source

- Part of the Society, Environment, and Reproduction study.
 - A longitudinal study of environmental variables' effects on women's reproductive health.
 - Two rural Kaqchikel Mayan communities in the southwest highlands of Guatemala (4,5).

Participants

- Parous women, living with a co-resident male partner, not pregnant at enrollment, not using chemical contraception.
 - 107 women were enrolled (8 unsuccessful and 40 successful pregnancies).

Sample collection

- First-morning urine samples were collected three times per week (2000–2001).

Analysis

- Adiponectin and other biomarkers were quantified using a Quansys multiplex female hormone immunoassay.
- R was used to model within-individual adiponectin trajectories from 60 days pre- to 60 days post-conception.

Discussion

Hypothesis:

- High adiponectin may result in the loss of pregnancy, as it indicates low energy levels and thus an inability to sustain pregnancy and provide energy to the embryo (6).
- Low adiponectin levels result in an unsuccessful pregnancy due to disruption of reproductive hormone secretion and inflammation of the endometrium (7).

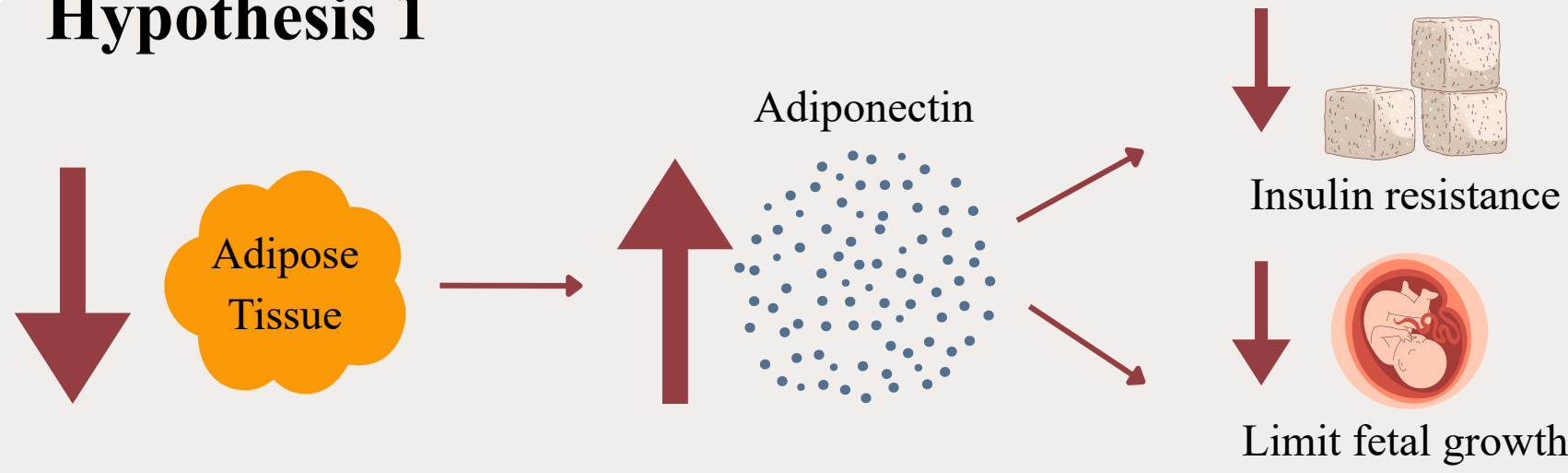
Our Findings

- Individuals with lower preconception adiponectin levels were more likely to lose a pregnancy than those with higher preconception adiponectin levels.
- There is greater change in adiponectin levels pre- to post-conception in those who experienced unsuccessful pregnancies.

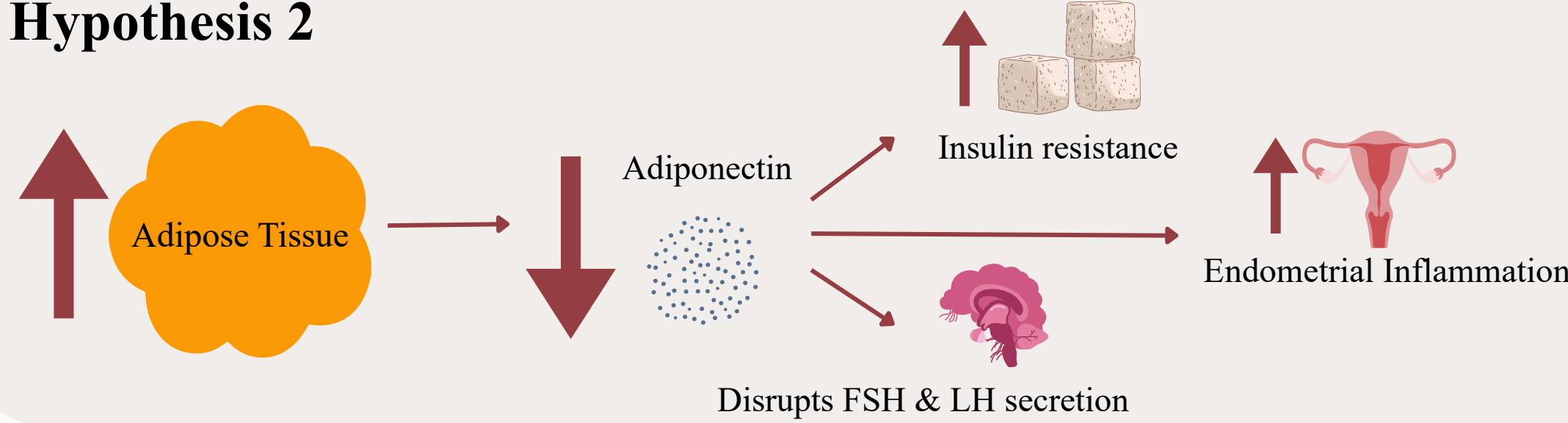
Limitations

- There was a variation in the sample size between the two groups.
 - $n = 19$ for successful pregnancies and $n = 4$ unsuccessful pregnancies
- Future studies should use a larger sample size to reduce bias.

Hypothesis 1



Hypothesis 2



Successful Pregnancy

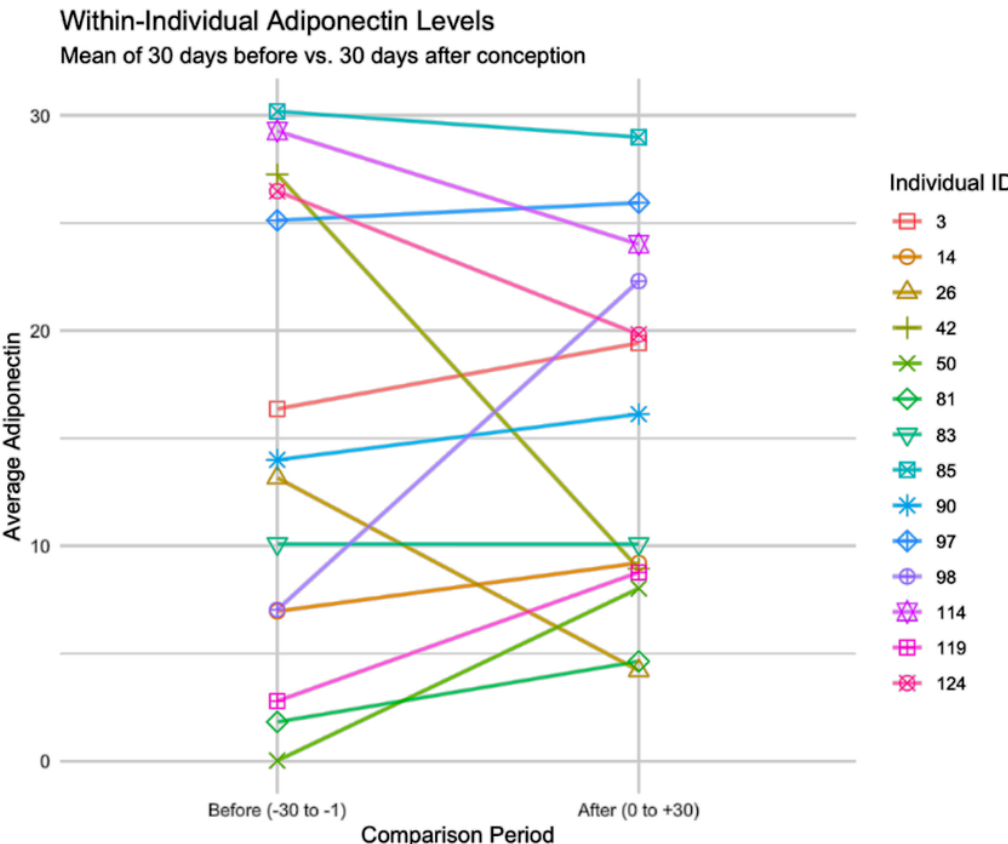


Figure 1. Within-individual comparison of mean adiponectin levels before and after conception in those with successful pregnancies. (30 day before and 30 days after ovulation date).

Table 1. Summary of key individuals and trends in individuals with successful pregnancies.

Trend	Number of IDs	Examples
Increase	13	ID 3: 16.36 → 19.42
Decrease	6	ID 114: 29.27 → 24.01
Stable	~2	ID 83: 10.091 → 10.09

Aggregate Adiponectin (n=19 Individuals)
Corrected: Anchor Dates extracted before filtering missing values

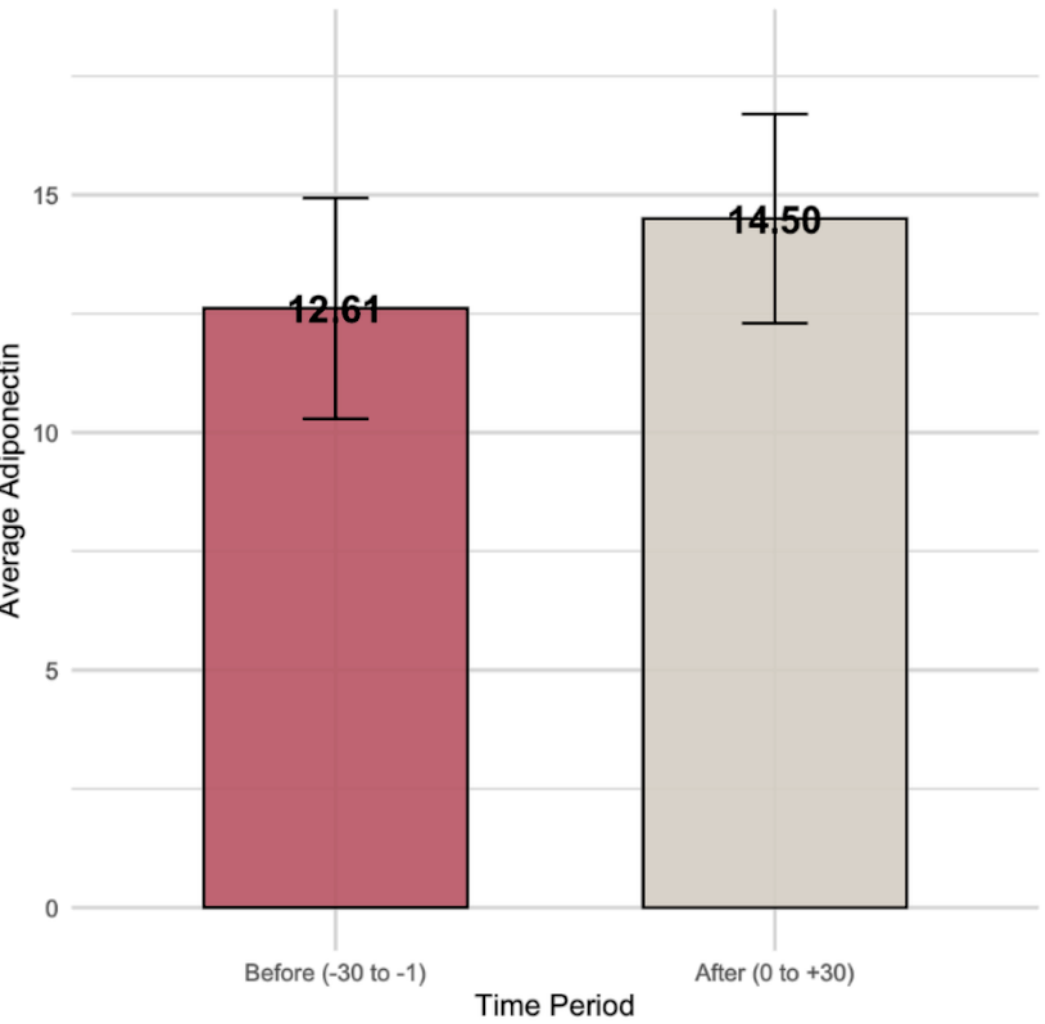


Figure 2. Comparison of aggregated adiponectin levels before and after conception in every participant with successful pregnancies.

Unsuccessful Pregnancy

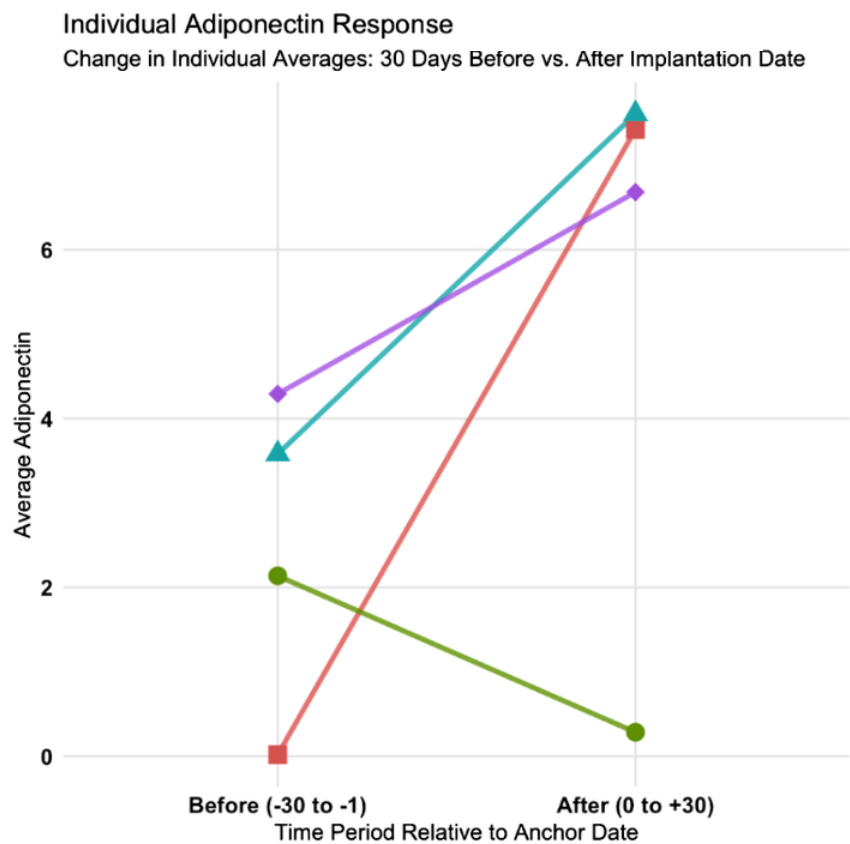


Figure 3. Within-individual comparison of mean adiponectin levels before and after conception in those with unsuccessful pregnancies. (30 day before and 30 days after ovulation date).

Table 2. Summary of key individuals and trends in individuals with unsuccessful pregnancies.

Trend	Number of IDs	Examples
Increase	3	ID 11: 3.58 → 7.61
Decrease	1	ID 102B: 2.14 → 0.29

Aggregate Adiponectin (Non-Pregnant, n=4)
Mean of Individual Averages ± SEM

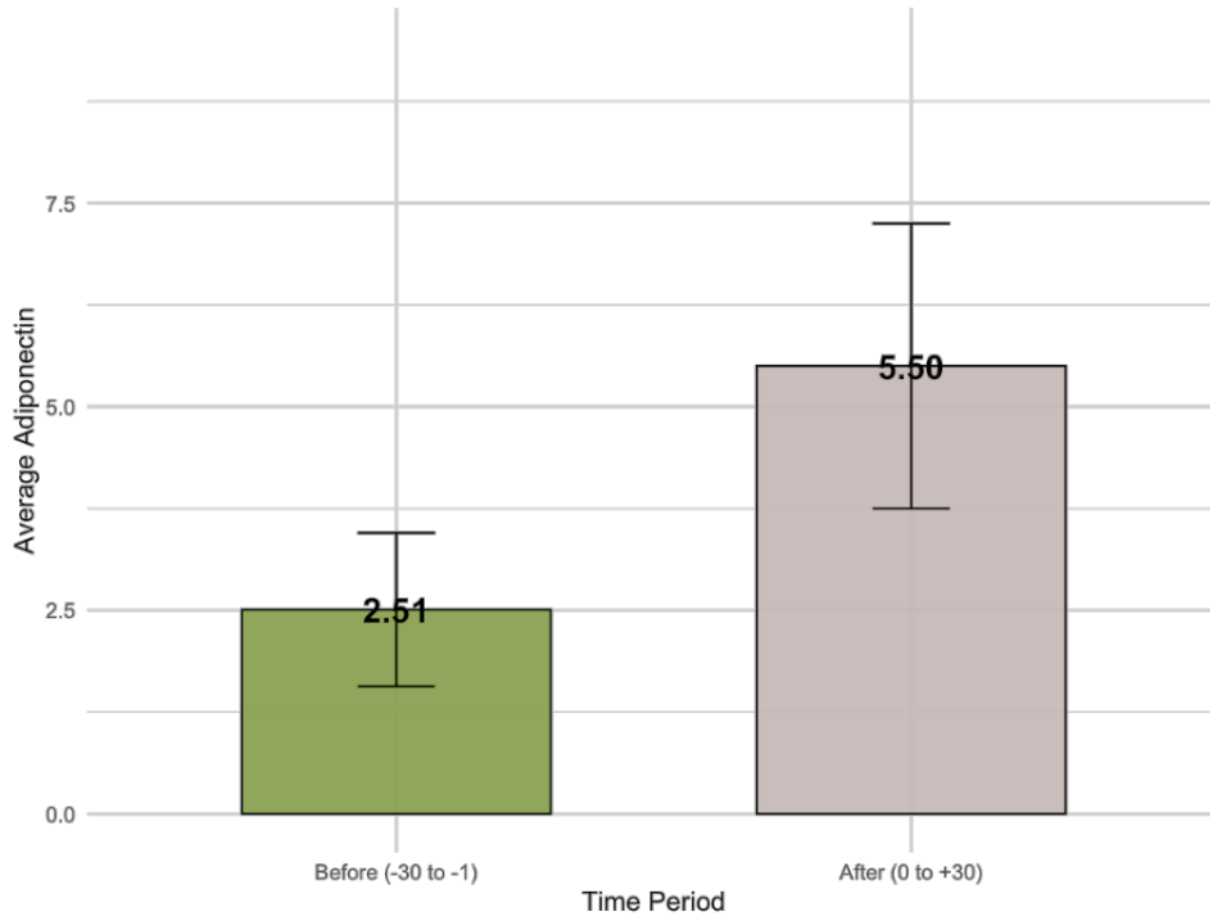


Figure 4. Comparison of aggregated adiponectin levels before and after conception in every participant with unsuccessful pregnancies.

Interpretation: Successful Pregnancy

Within-Individual Adiponectin Levels

- 68% of participants see a rise in adiponectin in the period following conception.
- 32% of participants see a decrease in adiponectin.
- Individual factors (ex. baseline BMI, diet, or hormonal interactions) may influence an individual's metabolic markers in response to conception.

Why the increase?

- In early pregnancy, adiponectin levels may shift to respond to the metabolic demands of pregnancy.

Analysis: Unsuccessful Pregnancy

Within-Individual Adiponectin Levels

- 75% of participants see a rise in adiponectin in the period following conception.
- Greater difference between pre- and post-conception adiponectin levels.
 - May be due to decrease in adipose tissue post-conception.
- Due to the small sample size, the data is sensitive to individual variation.

Acknowledgements

Special thanks to Wade Hurlburt for assistance with the data analysis.

Sources

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