

The report was made to determine whether acupuncture helps the rates of pregnancy among women using in vitro fertilization or not. The study supports acupuncture as a therapy to improve pregnancy rates.

Design of the study

76 women were selected for the experiment. The study had four patients with incomplete data, so the sample size was reduced to 72 women: 36 in the acupuncture group and another 36 in the control group. The sample size might not be sufficient. The research paper doesn't talk about the effect size. They just experimented with women who went to the university looking for in vitro fertilization. Sample sizes might vary regarding the effect size: if a small effect is expected, the experiment will need a larger sample; on the other hand, a bigger effect will require a smaller sample size. The study does not consider this when choosing the sample size.

This study included only women who lived in a geographic area closed to Ataturk University. It also had age and health limitations. The inclusion criteria considered women between 23-45 years old without any certain diseases. The results and conclusions cannot be generalized to all women, only to women with these features. The characteristics analysed were age, occupation, body mass index, and education level. The study did not consider all the other backgrounds on their lives and the human development index. Including their mental well-being, their living standards and financial capacity, their exposure to certain chemical elements, and their eating habits like not eating certain aliments due to their culture.

To measure anxiety levels, the authors used a self-assessment questionnaire. This test relies on the patient's testimonies and believes them as honest. Its reliability may vary because the accuracy of the results depends on whether the patients tell the truth about how they are feeling at that moment or not.

Results

Despite not being exposed to acupuncture, a significant number of women became pregnant (12 out of 36 from the control group). And in the group exposed to acupuncture, there was another significant number of women who did not become pregnant (13 out of 36 from the acupuncture group).

More than one way of explaining the set of data comes up and the authors are facing several competing explanations. If we can come up with multiple possible explanations from one set of data, an important problem in science can appear. According to Occam's razor, the simplest explanation (the one with fewest additional assumptions) that fits the results equally as well as more complex explanations will often be the correct one.

- a) To be plausible an explanation has got to fit with substantial established scientific theory. It has to be coherent and compatible with the existing theory and knowledge. Claiming that acupuncture has a biological effect and that it helps increase pregnancy rates, does not fit with any scientific theories. It is an extraordinary conclusion that requires

extraordinary levels of evidence (following Carl Sagan's theory) to start to overturn those fundamental theories in biology and chemistry. This study does not present that.

- b) This clinical trial considers that acupuncture sessions cause an increase in pregnancy rates, but the study does not prove that. Causality plays an important role in this study. If it is not the key. The authors did not explain why acupuncture increase the pregnancy rates, as they were assuming. According to the first Bradford Hill Criteria for causation, the stronger the association, the more likely it is that acupuncture increases pregnancy rates. The association between acupuncture and pregnancy is supposed to be the increase of uterine blood flow, the stimulation of the secretion of endogenous opioids, and hormone regulation. (Pinar Gursay Guven, Yasemin Cayir, Bunyamin Borekci, 2020).
- c) Another explanation is the placebo effect. Even though acupuncture had no medical effect, the women from the acupuncture group could believe the treatment was going to work. The women could feel like they are receiving the attention and cared that they needed. Consequently, this could have relaxed the patients causing them to change their hormone levels. The expectations that the women had on the treatment and the environment could have been so high that a placebo was likely to happen. Some patients are genetically predisposed to have different responses to the placebo effect.
- d) The positive association and the results could also be explained by the get better anyway effect. Many conditions will be reduced or increased over time either in the short or long term. Maybe some women were going through a period of low fertility for unknown reasons and they were going to become fertile again. Acupuncture is supposed to increase the pregnancy rates, but if it is not effective and they get pregnant, they were going to get pregnant anyway. The conclusion could be mistaken for thinking the acupuncture was the thing that made these women get pregnant. Whatever they would have done, the result could have been the same naturally.

Discussion

In the discussion, the authors refer to many other studies. Claiming that some of these have shown that acupuncture is a working technique to reduce infertility. These papers should also be reviewed. The authors should conduct a thorough examination of how they have carried out the studies to believe these affirmations as reliable. Careful attention should be taken to whether these studies really show a positive association or if they are just exaggerating one single result. Also, this study includes two times of self-referencing (references 5 and 10). These could not be problematic, but extreme self-citing may cause an ethical problem and manipulation.

Their only limitation is not to include a type of acupuncture. This fact exposes the lack of self-criticism. The sample size may not have been sufficient. Having a smaller sample size than it should be may cause some implications. The first one is assuming as true a false basis. They have low statistical power that could lead to an inflated false discovery rate.

The limited geographic area is a weakness in the research. Consequently, the generalizability of these results may be limited. The women selected to participate in this study were random patients who visited Ataturk University. They might live in the same neighbourhood or have similar conditions due to their living area. The trial should be repeated in different settings using different methods to reassure their hypothesis. Reproducing the experiment again will provide consistency to the experiment.

The study protocol was approved by the ethics committee of the same university that funded the research project. They may not have been critical enough about the procedure since it was a project funded by the university itself. The certification of the protocol by a third independent party detached from the university could ensure greater criticism and ethical standard.

Conclusion

Acupuncture could have some effects on pregnancy success rates for women undergoing in vitro fertilization, but this trial does not give enough evidence to confirm this hypothesis.