Marijuana's Effect on Fetal Development

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Background and Significance

- Marijuana (Cannabis) is a mixture of dried and shredded leaves, stems, seeds, and flowers of the hemp plant Cannabis Sativa.
- It is used as a psychoactive drug, which means mind altering.
- Many states are now legalizing the recreational and medicinal use of marijuana.
- Because of this fact, the amount of people who consume marijuana has increased.
- Majority of the people who use marijuana are young and in their reproductive ages.
- Once women using marijuana becomes pregnant, many do not quit consuming it.

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Review of Literature

- Marijuana effects the birth weight of fetuses.
- Cannabinoids also can cause premature birth or miscarriage.
- Marijuana weakens the fallopian tubes and also effects the neural development of the unborn.
- Cannabis mixes up cellular growth as well as decreases uterine receptivity.
- Thc/Marijuana also changes how the mesocorticolimbic pathways function.

Statement of Individual Question

Materials and Methods

- The literature reviewed for this article was published in the English language between 1975 and 2015, and was collected from the MEDLINE database. Initially, exploratory searches were conducted using the keywords cannabinoid, embryo, and development. Afterward, searches were conducted using combinations of the Medical Subject Heading (MeSH) terms Cannabinoids, Cannabis, Marijuana, and Fetal Development. I reviewed the selected articles for relevance and shortlisted the articles that included the in vitro or in vivo effects of altered cannabinoid signaling, in vivo concentrations of cannabis following cannabinoid use or infusion, and epidemiological effects of cannabis use. Additional articles were selected from the references of finalized articles.

- Under normal physiologic conditions, cannabinoid signaling exhibits a wide-range of downstream effects embryologically. This breadth of action ultimately manifests in the symptoms associated with cannabis use during pregnancy, including miscarriage, congenital malformations, and learning disabilities. Cannabinoids have received renewed attention in the field of cancer treatment due to their pharmacologic activities in vivo as cell growth inhibitors, restrictors of cellular motility, and their ability to induce apoptosis across multiple cell lineages. However, by the same mechanisms that cannabinoids show promise in the field of cancer treatment, they prove equally dangerous to the viability and health of a developing embryo.
- The effects of cannabinoids on pre-implantation and embryologic development have the potential to elicit harmful outcomes post-natally. While the method of consumption can affect the severity of the embryologic effects, it is important to note that this paper is an overview of the effects solely of elevated cannabinoid signaling. A common means of cannabis consumption is smoking, which can add a number of toxins and thereby amplify harmful effects to the embryo. Given the trend of marijuana decriminalization and legalization across the United States, further epidemiological research should focus on the association between maternal cannabinoid use and observation post-natal outcome.

Results and Conclusion

Discussion

- The unintended promotion of marijuana due to current legislation on the usage and legal status of marijuana. It is obligatory that the influence of fetal exposure to the drug is assessed. Even though in utero cannabis exposure has been correlated with early pregnancy failure, birth defects, and developmental delay, the mechanisms of such effects are to a great extend unexplained. The usage of cannabinoids in cancer treatment by means of growth inhibition and apoptosis may demonstrate how cannabis exposure likely harms a growing fetus. Cannabinoid signaling is necessary for precise pre-implantation development, embryo transport to the uterus, and uterine receptivity during implantation. In post-implantation development, cannabinoid signaling functions in a multitude of alternative approaches, including, but not limited to, folic acid, VEGF, PCNA, MAPK/ERK, and BDNF. Multiple essential and vital in utero processes like angiogenesis, cellular replication, tissue differentiation, and neural cognitive development get disrupted by the normal activity of these pathways. The objective is to determine the impact of cannabis exposure on a developing embryo with the purpose of providing a molecular clarification for the detrimental consequences related to cannabis consumption during pregnancy. Embryologically, marijuana exhibits a wide spectrum of disadvantageous effects. This illustrates the magnitude of how harmful cannabinoids are in the embryo both in the short term and the long term.

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