

INPLASY PROTOCOL

To cite: Deng et al. Diet-induced male infertility in mice models: a systematic review and network meta-analysis. Inplasy protocol 202250116. doi: 10.37766/inplasy2022.5.0116

Received: 18 May 2022

Published: 18 May 2022

Corresponding author:
YingJun Deng

dengyingjun9413@163.com

Author Affiliation:
Xiyuan Hospital of China
Academy of Chinese Medical
Sciences.

Support: National Natural
Science Found.

**Review Stage at time of this
submission:** Data extraction.

Conflicts of interest:
None declared.

Diet-induced male infertility in mice models: a systematic review and network meta-analysis

Deng, YJ¹; Liu, SJ²; Zhao, M³; Zhao, F⁴; Guo, J⁵; Yan, B⁶.

Review question / Objective: In order to compare the different high energy diet such as high-fat diet and high sugar diet how to damage the male mice model in metabolize and fertility, and explore a reliable mice model method in the study of obesity with male infertility. **P:** obesity mice model with male infertility. **I:** High energy diet such as High-fat or High-sugar diet. **C:** High-fat diet, High-sugar diet, compared with normal diet in mice model. **O:** High energy diet induce male mice obesity model and damage their fertility. **S:** Use network meta-analysis.

Condition being studied: The relationship between obesity and male infertility attract more and more attention at present. So many animal experiments are carried out on this problem, there are enough experimental articles to support this meta-analysis.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 May 2022 and was last updated on 18 May 2022 (registration number INPLASY202250116).

INTRODUCTION

Review question / Objective: In order to compare the different high energy diet such as high-fat diet and high sugar diet how to damage the male mice model in metabolize

and fertility, and explore a reliable mice model method in the study of obesity with male infertility. **P:** obesity mice model with male infertility. **I:** High energy diet such as High-fat or High-sugar diet. **C:** High-fat diet, High-sugar diet, compared with normal

diet in mice model. O:High energy diet induce male mice obesity model and damage their fertility. S: Use network meta-analysis.

Rationale: We Integrate studies with meta-analysis to explore a reliable mice model method in the study of obesity with male infertility. We collect information included Mouse species, experimental diet, duration of intervention, and outcome index such as body weight, sperm analysis, reproductive hormone, Reproductive morphology and reproductive ability.

Condition being studied: The relationship between obesity and male infertility attract more and more attention at present. So many animal experiments are carried out on this problem, there are enough experimental articles to support this meta analysis.

METHODS

Search strategy: We search the main three databases web of science(SCIE), pubmed, embase, The search strategy was below:
 "Obes" and "sperm" and "diet"
 "High-fat" and "sperm"
 "High-fat" and "male and fertility"
 "High sugar" and "sperm"
 "High sugar" and "male and fertility"
 performed on 20 March 2022, in the databases Web of Science and PubMed, Scopus, and PubMed.

Participant or population: Obesity mice model with male infertility.

Intervention: Diet of high-fat or high-sugar/ inherited obesity model.

Comparator: Mice with normal diet.

Study designs to be included: Mice experimental use a diet-induced obese model and use reproductive indications as outcome index.

Eligibility criteria: We except the diabetic model in the study, and core data missing.

Information sources: Database, contact with authors.

Main outcome(s): obesity index: such as body weight, BMI, TC, TG, LDL-C and so on reproductive hormones: T, E2, FSH, LH Reproductive morphology and reproductive ability.

Data management: We use excel to extract the data, then use R software to analysis the data.

Quality assessment / Risk of bias analysis: We plan to use a regression-based test of funnel plot asymmetry (each effect size is plotted against its precision), termed Egger's regression, which evaluates whether effect sizes are distributed as expected, given associated sampling errors. And to perform a "trim and fill analysis." Trim and fill analyses estimate the number of effect sizes that are likely missing owing to bias and re-estimated the overall mean effect (as produced by REMA) after accounting for missing studies.

Strategy of data synthesis: For the meta-analysis, we implemented a random-effects meta-analysis (REMA). We implemented REMAs using the "rma" function in the meta-analysis R package, metafor, 47 by fitting each calculated value of d as the response variable and the square of the SE_d as a measure of the sampling variance.

Subgroup analysis: Subgroup Analysis of Different Mouse Varieties and Intervention Methods.

Sensitivity analysis: By eliminating some studies one by one to explore its impact on combined effect variables, repeated Meta analysis, the results will be compared with the original effect. If there is no significant change between the effect amount and the original effect amount after excluding a certain article, the result is stable. Otherwise, the results are unstable and need to be cautious when explaining the combined effect conclusions, suggesting bias and further studies are needed to verify.

Language: English.

Country(ies) involved: China.

Keywords: Diet-induced obesity, mice model, male infertility.

Contributions of each author:

Author 1 - Yingjun Deng - study design, data collection, data extraction, data analysis and manuscript writing.

Email: dengyingjun9413@163.com

Author 2 - ShengJing Liu - data collection, data extraction, data analysis.

Email: liu-shengjing@qq.com

Author 3 - Ming Zhao - data collection and data analysis.

Email: bucmzhaoming@126.com

Author 4 - Feng Zhao - data analysis and manuscript writing.

Email: 493600550@qq.com

Author 5 - Jun Guo - study design and article evaluation.

Email: guojun1126@126.com

Author 6 - Bin Yan - study design and article evaluation.

Email: 824565870@qq.com