

Lifestyle & Male fertility

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Introduction

-Approximately 10 to 15% of couples are impacted by infertility. The role that lifestyle factors play in the development of infertility has generated a substantial amount of interests.

-Since male reproductive health could be affected by lifestyle factors, healthcare providers and patients are seeking recommendations for **lifestyle optimization.**



Heat stress

- The male testes are located outside the body cavity with temperatures **2 to 4°C** cooler than body core temperature.
- In many animal studies, increases in scrotal temperature have been shown to cause damage to the **germinal epithelium, sperm DNA integrity and Sertoli cell function.**

Fertig RM et al. Dermatol Online J 2017



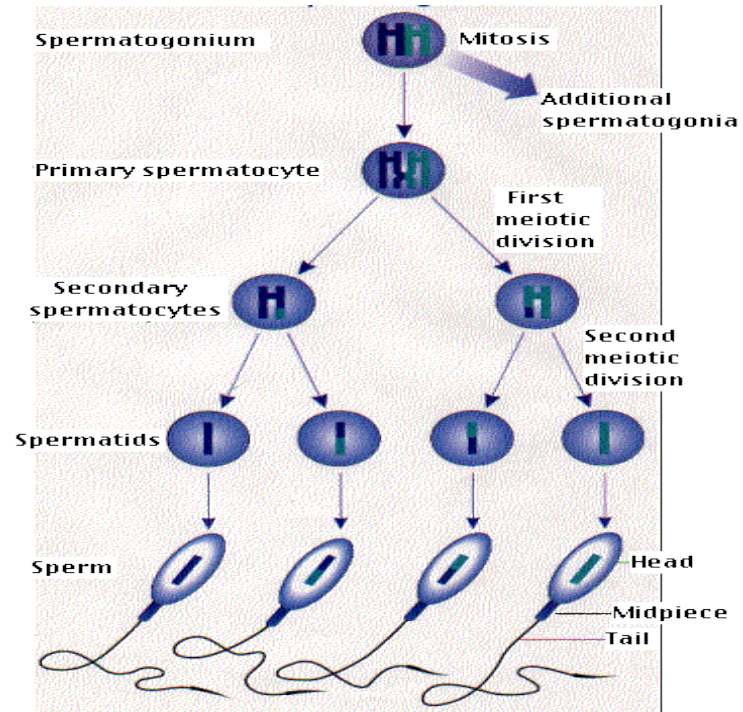
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Spermatogenesis

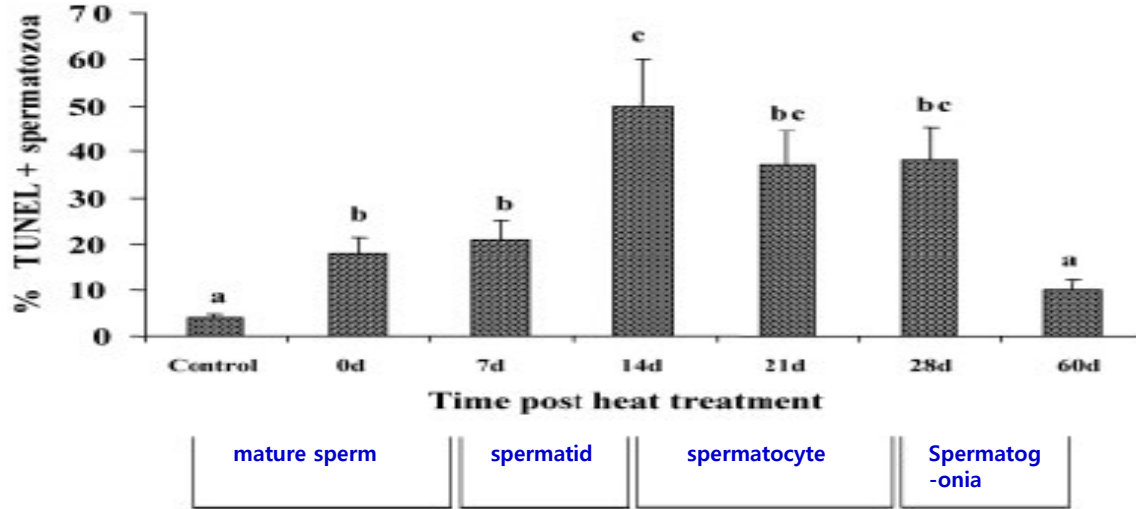
Spermatogenesis can be divided into four phases,

- 1) mitotic proliferation
- 2) meiotic division
- 3) spermiogenesis
- 4) epididymal sperm maturation

which take approximately 3 months.



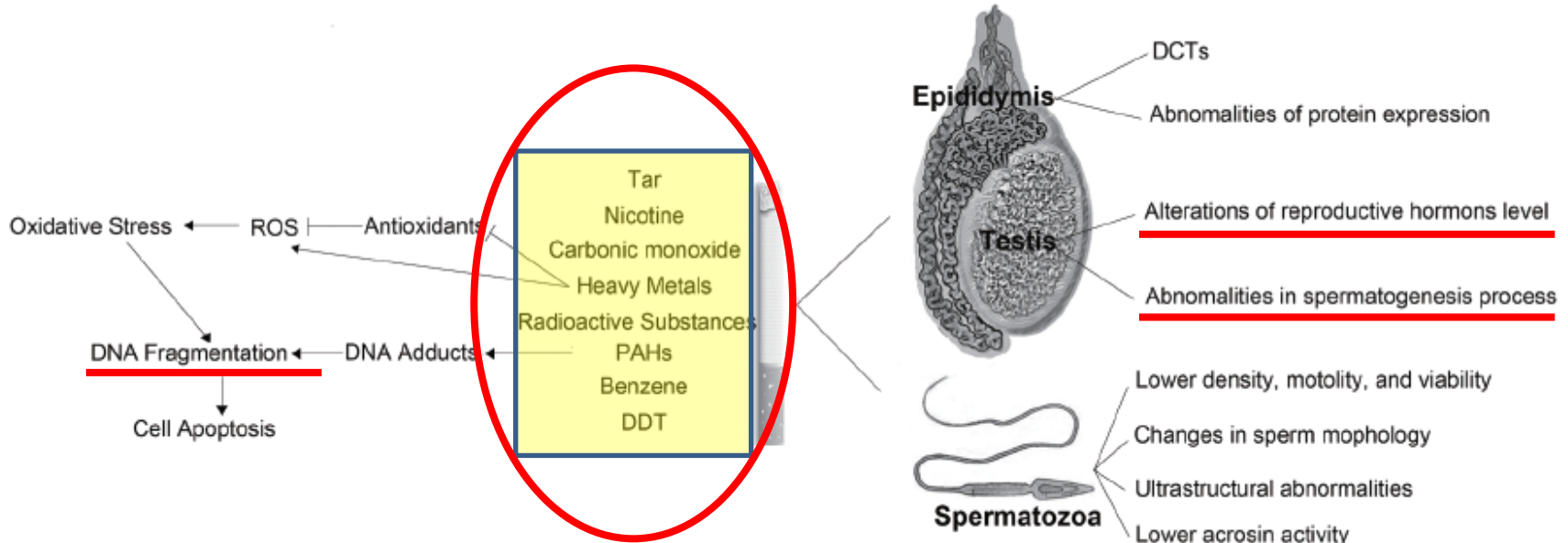
Heat stress



- Mouse lower third: in a **circulating water bath at 42°C for 30 min.**
- Scrotal heat stress could affect sperm viability, sperm DNA integrity

Perez-Crespo et al, Mol Reprod Dev 2008

Smoking



Smoking

-Significantly higher sperm with DNA damage was reported in the semen of smokers compared with nonsmoker.

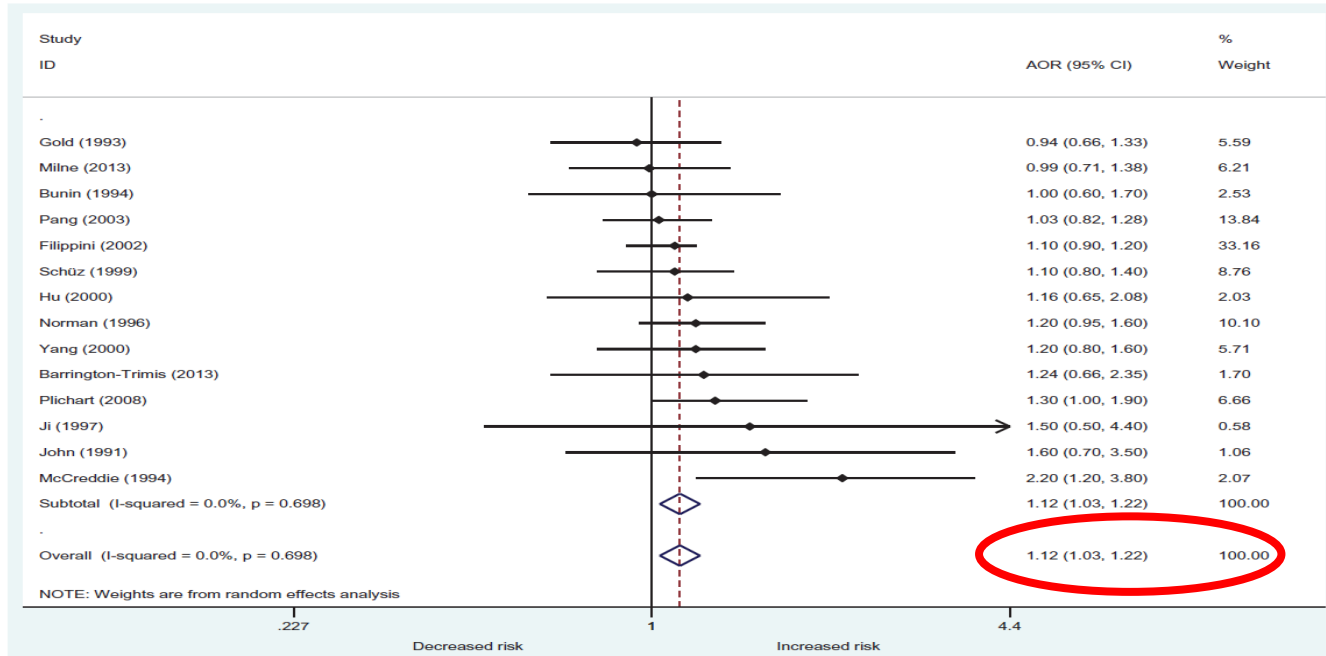
-Paternal cigarette smoke exposure can affect **the sperm fertilizing capacity, embryonic development.**

Kapawa et al, Andrologia 2004



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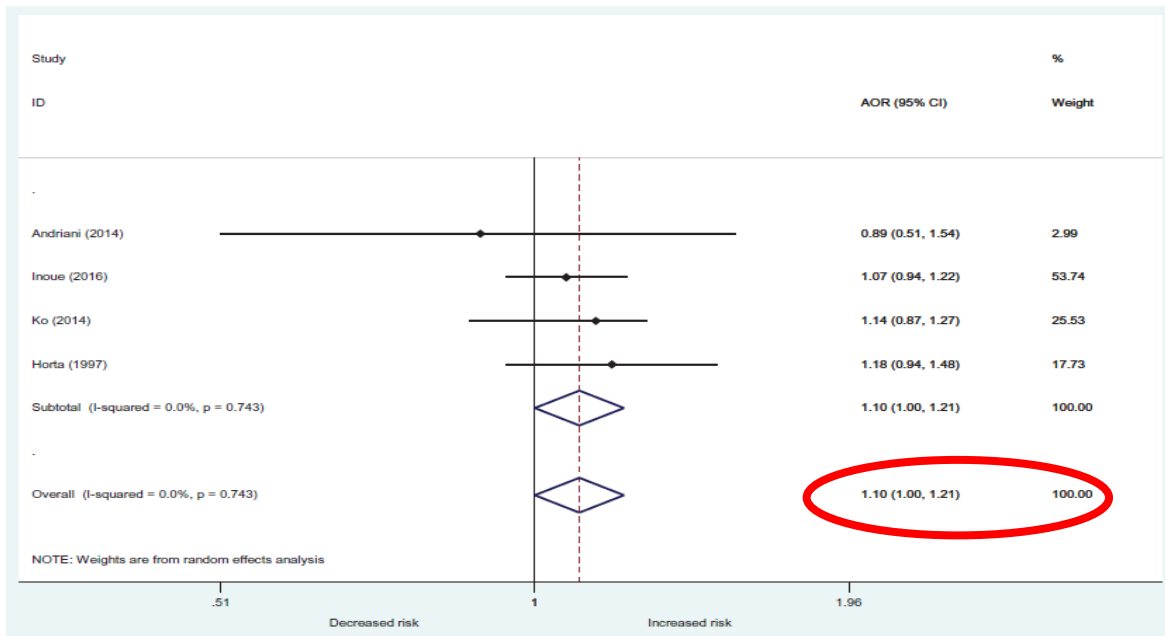
Paternal smoking & pediatric risk



Risk of tumor in offspring

Oldereid NB, et al. Hum Reprod Update 2018

Paternal smoking & perinatal risk



Risk of low birth weight (LBW) in offspring

Olderid NB, et al. Hum Reprod Update 2018



Alcohol

-Excessive alcohol consumption has been proposed as a risk factor for male infertility.

-Studies have suggested that alcohol could **impair secretion of gonadotrophin-releasing hormone (GnRH)** resulting in reduction of LH and FSH, with subsequent spermatogenic impairment.

Kim et al. Brain Res 2003



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Obesity

-With higher adipose tissue, obesity can result in **hypogonadotropic, hyperestrogenic, hypogonadism.**

-Male obesity is also associated with comorbidities, including **metabolic syndrome, hypercholesterolemia, and a pro-inflammatory state,** all which have been linked with male subfertility.

Ramlau-Hansen et al. Hum Reprod 2007



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Obesity

-Obesity is an important risk factor for many diseases including **cardiovascular disease, type 2 diabetes, and erectile dysfunction.**

-Evidence suggests that male fertility could be decreased by being either **overweight or underweight.**

-Healthy diet and regular exercise are recommended to maintain **BMI between 20 and 25 kg/m².**

Barazani et al. Urol Clin North Am 2014



Diet

-Studies have suggested that diets categorized as **high in fish, fruit, vegetables, and whole grains** were associated with significantly better sperm quality compared with diets categorized as high in red meat, processed meat, sugary drink.

-Men with high **dietary saturated fat** have been reported to show **decreased sperm quality**.

Attamanet al. Hum Reprod 2012



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Diet

- Environmental toxicants obtained through diet, including phytoestrogens from soy, dairy products, and beef, are harmful to men's reproductive potential is still questionable.
- The paucity of well-designed human studies on male infertility in relation to diet makes drawing conclusions difficult.



Life style modification

- Cessation of smoking
- Avoidance of hot sauna
- Healthy diet & good nutrition
- Regular exercise & reduce stress



In perspective

- Male reproductive health can be affected positively or negatively by lifestyle factor such as smoking, obesity, scrotal temperature, hot sauna.

- Lifestyle factors can be modified and they are under one's own control. These lifestyle factors may provide an opportunity for therapeutic intervention in the subfertile male.

