may be released during breastfeeding when fat tissue is mobilised, raising further health concerns.

Figure 1: Potential effects of exposure to environmental factors [1,2]; EDCs, Endocrine Disrupting Chemicals (Created with BioRender.com).

→ **Parental exposure to pesticides and air pollution are linked with childhood leukaemia.**

- Maternal and paternal exposure to pesticides before and/or during pregnancy as well as air pollution have been identified as factors linked to an increased risk of acute childhood leukaemia.

→ **Exposure to chemicals is linked with impaired neurobehavioral development.**

- Prenatal exposure to chemicals such as endocrine disrupting chemicals (EDCs), alcohol, and organophosphate pesticides has been linked to compromised cognitive development [3]. Furthermore, exposure to other toxic agents has been linked to increased risks of attention deficit/hyperactivity disorders and/or autism spectrum disorders in the developing offspring.

→ **Pesticide exposure may lead to metabolic syndrome/obesity in the offspring.**

- Prenatal exposure to certain substances, including EDCs, pesticides and insecticides, can elevate the risk of obesity and metabolic syndrome in offspring by affecting their energy metabolism.

→ **Maternal occupational exposure is associated with congenital malformations.**

- Maternal occupational exposure to solvents, occurring from three months before conception until the end of the first trimester, is associated with an increased risk of neural tube defects in offspring.

→ **Persistent organic pollutants alter the immune system.**

- Early-life exposure, both pre- and postnatal, to persistent organic pollutants has the potential to disrupt the developing immune and respiratory systems, reducing the offspring's capacity to combat infections and heightening the risk of allergic manifestations such as asthma.

Effect of environmental exposure on the reproductive health of offspring

→ **Male offspring: effect on genital anomalies, testicular function and testis cancer.**

- Exposure in early gestation to factors such as maternal smoking, maternal stress, chemicals with anti-androgenic properties or mild analgesics have been implicated in disrupting the normal differentiation and growth of male reproductive organs.
- Prenatal exposure to EDCs has been associated with altered testicular descent, leading to cryptorchidism. Substances like glycol ethers can directly interfere with urethra or penis formation, resulting in conditions such as hypospadias or micropenis. Bisphenol A (BPA) has been linked to impaired semen quality and testicular function in young adult men, as well as with an increased incidence of testicular diseases and testicular germ cell tumours.

→ **Female offspring: effect on ovarian function and genital anomalies with a transgenerational effect.**

- Numerous studies have connected gestational exposure to environmental and occupational stressors, including EDCs, air pollution, and cigarette smoking, with postnatal health issues in women. Exposure to substances like diethylstilbesterol (DES), phthalates, and bisphenols has been linked to earlier puberty onset, an increased risk of polycystic ovary syndrome and endometriosis, disrupted menstrual cycles, and infertility or longer time-to-pregnancy in female offspring.
- Furthermore, adult uterine abnormalities can be influenced by developmental effects induced by EDCs, possibly mediated by changes in genes relevant to uterine structure and endometrial function, with potential transgenerational implications [4, 5].

Time for action: policies to reduce the effect of environmental exposure on offspring health.

Facilitate Research

- ✓ **Foster research to uncover correlations between environmental and occupational sources of exposure, such as air pollution, and health outcomes in children.**
- ✓ **Improve surveillance by establishing channels for reporting health-related concerns and suspected cases of disease caused by environmental exposure.**

Promote Awareness

- ✓ **Disseminate knowledge and educate families and communities about the most common environmental risks and measures to prevent them.**

Support Prevention

- ✓ **Develop and enforce prevention strategies to mitigate health risks linked to environmental factors like air pollution and hazardous chemicals.**
- ✓ **Increase the requirements for evaluating the developmental toxicity and subsequent approval of chemicals to be used by consumers and workers.**
- ✓ **Stay abreast of emerging environmental research and concerns to inform policy decisions.**

References[1]

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[1]Only key papers were included. Further detailed references on individual studies can be requested from ESHRE by contacting guidelines@eshre.eu

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