“Fertility is a team sport,” said Dr. Eisenberg, a urologist and the head of male reproductive medicine and surgery at Stanford University School of Medicine. A seemingly obvious statement, yet one that could not ring truer. It is universally known that for an embryo to be created, an egg and sperm are required to enable the process. Many assume it is a woman’s lack of fertility that prevents her from becoming pregnant. This may be true; however, she is not the sole reason for a couple’s infertility. In reality, paternal age is also extremely important in the conception of a healthy child. It was estimated that forty percent of infertility cases are either fully or partially reliant on the male [1]. In addition to environmental factors and teratogens, elements which can disturb the development of an embryo or fetus, the age of the mother and the age of the father affect gamete health. The older the couple, the harder it is to conceive. Along with a mother’s advancing age comes health risks to her and her baby, such as gestational diabetes. This same risk is evident with men as well. A male’s sperm count and mobility decline with age, thus making it harder for spermatozoa to reach the egg and to fertilize it. Not only do male and female age contribute to the difficulty of a woman becoming pregnant, but a child born from aged eggs and sperm are at a higher health risk proportionate to the age of the parents at the time of conception.

Today, it is common for individuals to desire to finish their schooling before attempting to find a mate [2]. This means that by the time a couple is ready to have children, they are older and health risks for their children have become greater. It has been known for some time that the ability to become pregnant and conceive decreases with age. However, this concept has been found to matter for men as well. A study in the United States has shown that advanced paternal age has an effect on the baby in terms of prematurity, lower birth weight and other adverse effects [2].

As more and more studies show the effect of paternal age on the ability to conceive healthy children, the factor in play appears to be total motile sperm count (TMSC). In a study performed by a fertility center in New Jersey, sperm cell count decreased by six percent in 120,000 male patients in a period of three years [4]. Researchers from Hebrew University and Mount Sinai’s School of Medicine discovered that sperm counts were reduced by fifty percent from the years 1973 to 2011 in 43,000 men. Universally, viable sperm is declining, both in men who are experiencing fertility problems and even in men who are not. The cause is unclear but appears to be associated with dietary and non-active lifestyles. Speculation has focused on the increase in the chemicals that the general population has been exposed to since World War II, not only in variety, but in ever increasing quantities.

In the book of Bereishit, the first mitzvah in the Torah directed at Jewish men is ‘pru u’rvu’, the commandment to have children, to ‘be fruitful and multiply’ [5]. With this imperative, one should be
aware of factors that play a role in preventing fertility and how to improve a male’s chances of producing offspring. There are also many laws in the Torah that govern marital relations. One such occurrence termed “religious infertility” refers to the inability to get pregnant due to the niddah period, where a woman is not permitted to have intimate contact with her husband [6]. During the time of a female’s menstruation and for seven clean days thereafter, a woman is prohibited to her husband. This may lead to fertility issues in some women, especially for a woman who has a short menstrual cycle. Because of this unique situation, artificial insemination and in vitro fertilization - processes by which the egg is fertilized with the husband’s sperm without intimate contact by the husband and the wife - were allowed according to most rabbinic authorities even during the niddah state. Interestingly, another practice that may contribute to fertility issues for males has to do with the high temperature of the water in the mikveh [7]. For those men who use the mikveh daily, the heat may have harmful effects on semen quality, and result in the spouse having difficulty conceiving.

Related to the commandment of producing offspring is the prohibition of masturbation. In Niddah 13a, wasting of seed is seen as transgressing the obligation of bearing children [1]. Known as botza’at zera levattala or hash-hatat zera, masturbation would fall under the category of “improper emission of genital seed”. This commandment prohibits the limiting of a man’s ability to conceive, as he is squandering viable sperm that could be used for the mitzvah of procreation.

Throughout early Jewish history, two of our forefathers, Avraham and Yitzchak were barren for many years before having children. Sarah, Avraham’s wife, prays for a child and when she is almost ninety years old, an angel informs her that in the coming year she will have a son [8]. Sarah laughs; she has trouble believing the angel because her husband is too old. Even back then, there seemed to be an understanding that the age of the father could affect fertility.

In Melachim Bet, Elisha Hanavi is a guest of the Isha Hashunamit. [9]. She and her husband have been childless for many years and Elisha, wanting to repay the couple for their kindness, blesses the Isha Hashunamit with a child, which she will give birth to in the coming year. She refuses, thinking it is impossible at her and her husband’s old age. Regardless, the prophecy of Elisha comes true and the couple is blessed with a son. The child grows up, only to die suddenly. The only clue from the text as to the cause of death is the reference to a headache suffered by the child. This story is quite puzzling. Might the elevated age of the couple at the time of conception have affected this child?

Curiously, by the time males reach the age of thirty-four, sperm counts start to fall [10]. In general, the number of sperm per semen sample, the motility and the vitality of sperm decline in a man’s early forties. Sperm function as well as sperm counts gradually decrease in the decade between a man’s thirties and forties. Of course, there are other factors that affect a male’s reproductive capacity besides his actual age, such as nutrition and lifestyle, sexual function and activity, and oxidative stress and inflammatory and immune disease. Research shows that there are three neurocognitive diseases that are highly correlated with advanced paternal age: schizophrenia, bipolar disorder and autism [10]. In studies done on each of these disorders, the maternal age and other risk factors were held constant in order to test the impact of paternal age. It was found that fathers in the twenty-thirty age range always had a much lower risk associated with bearing children with one of these particular disorders, as opposed to fathers over fifty years of age.

To confuse matters somewhat, teenage males also have a higher risk of fathering children with these disorders. For younger men, the risks associated with fathering children are likely due to immature sperm, alcohol and drug abuse and/or a stressful environment.

Many other congenital abnormalities, autosomal dominant disorders, miscarriages and pre-eclampsia have been linked to advanced paternal age. As a male gets older, the risk of fetal death, pre-term birth and low birth weight also increases slightly. In many of these cases, the mother’s age also mattered. However, the difference in paternal age seemed to have a much more pronounced effect than did maternal age. In one research study conducted on paternal age and the transmission of mutations to offspring, it was estimated that a man in his mid-thirties would transmit double the amount of mutations to his children in comparison with a twenty-year-old father. However, a man seventy years of age would pass on eight times that amount of mutations [11].
Astonishingly, when age was taken into account from both parents, offspring mainly inherited mutations from the paternal side.

With more infertility issues arising due to late marriage and perhaps, the introduction of newer teratogens in our environment, there are constant innovations in technology to resolve these problems. With these innovations, questions arise as to whether such situations should ethically be allowed due to the indirect health effect upon the unborn child. MicroSorting has become one such new method that is used to separate and distinguish between the X and Y chromosomes, thereby preventing X-linked genetic diseases [12]. Through FISH (fluorescence in situ hybridization), analysis of the X and Y chromosomes can be identified through the emission of certain colors. MicroSorting is also being used for gender selection and family balancing. Once this FISH analysis has been introduced and parents can decide what gender child they want, the questions have to be posed as to whether technology is enabling the human race to play G-d. Where is the limit? As humans, do we have the right to impose our own views of how our children should look and behave? [13]. Despite the ethical questions that arise, MicroSorting is believed to be a tool that can prevent risks to babies being born to older couples or for those who have had difficulty in conceiving.

There is much evidence today that illustrates the association of advanced paternal age and damage to sperm DNA resulting in abnormalities and breakage [10]. In turn, this affects a couple’s ability to conceive and may result in potential health risks to future children. For these reasons, it is not only important to know, but obligatory to teach others and to provide the necessary means such as genetic counseling and prenatal testing for genetic disorders so that people understand the risks of producing offspring later in life.

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References