

Original Article

Ethical Dimensions in Relation to the Increased Age of the Father in the Recommended Reproduction

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Abstract

Background: Today more and more men become fathers in an advanced age. We decided to proceed in this literature review study to collect data and come up with results of the dangers, the ethical dilemmas that arise in response to our search query. Is it moral to become a father in old age? Is it moral to help someone become a father in old age?

Methodology: We researched in pubmed with paternal age, in vitro fertilization and we found a total of 142 results. The survey was conducted in March 2018. Included studies in English, French or Greek language.

Results: We found results with “No associate found with a risk” and results with “Old age correlation with some danger”. In conclusion it is possible that healthy children can be born to older men through assisted reproduction.

Conclusions: In our opinion, a man over 60 years of age, the age at which normally health problems begin to appear, must have access to all the necessary information and he must study in depth the chances, difficulties and weaknesses of each choice open to him so that in conjunction with the rights of his as yet unborn child and with the constant support of the doctor a decision which is fair to all can be reached.

Keywords: paternal age, in vitro fertilization

Introduction

In this age, more and more men become fathers in old age. In the western world, there is a tendency for delay in childbearing, while very little is known about the consequences of father birth in an old age (Sagi-Dain, Sagi, Dirnfeld 2016).

In the face of these incomplete facts and the moral dilemmas faced by health providers as regards the rejection of fathers' requests for assisted reproduction (Klitzman, 2016) we decided to proceed in this literature review study to collect data and come up with results of the dangers, the ethical dilemmas that arise in response to our search query. Is it moral to

become a father in old age? Is it moral to help someone become a father in old age?

Methods

We researched in pubmed with paternal age, in vitro fertilization and we found a total of 142 results. The survey was conducted in March 2018. Included studies in English, French or Greek language.

Results were excluded that date back to the eight-year period, ie studies published in 2010 and earlier. Figure 1 analyzes the exclusion criteria for studies.

At the end of this article, and in particular in the bibliography section, we list 142 results as they were exported by pubmed. It will be appreciated that the studies with numbers: 1, 2, 3, 5, 6, 7, 11, 13,16,17,18,19,29,30,33,34,37,38,39,43,44,49,53

,57,58,59,60,63,64,68,69,70,72,74,80,82,84,92,93,94,96,103,104,105,106,109,112,113,114,115, 119,120,121,122,125,130,131,132,133,134,140 and 142 were excluded due to the publication date (2010 and earlier a total of 62 studies).The exception was made to study the newest results about the dangers of increased paternal age in assisted reproduction because of assisted reproduction sector has grown rapidly in recent years. Insisting on earlier results would make our study inaccurate and anachronistic. Studies in numbers 14, 25, 28, 46, 48, 50, 52, 71,75,77,86,99,129 and 139 were excluded either due to the title or the summary (either absent the summary or written in Chinese or German language either searched for animal reproduction or was irrelevant to the age of the father. Total studies 14). The 26 studies included are outlined at the end of the manuscript in Table 1.

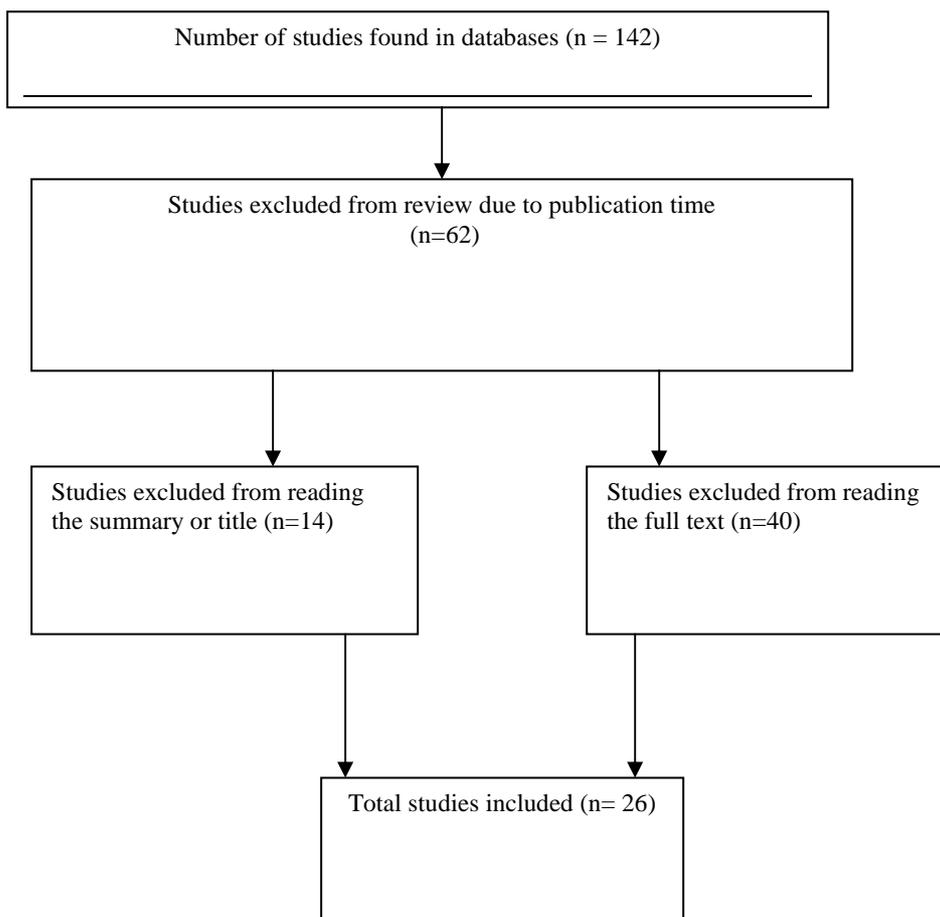


Diagram 1. Explanation studies selection

Results

In our study we found binding effects of increased paternal age with increased DNA fragmentation rates and failure in pregnancy (Kaarouch et al., 2018), (Garcia-Ferreira et al., 2015) and the latter study further with sperm aneuploidy rates in embryos. Also with increased risk of autosomal dominant disorders, impaired neurocognitive development, increased risk of adverse postnatal manifestation of pregnancies (Sagi-Dain, Sagi, Dirnfeld, 2016), with decreased levels of success in IVF (Chapuis et al., 2017). Similar results are found in their studies by (Elhanbly et al., 2015) who argue that in CBAVD (congenital bilateral absence of the vas deferens) cases that male age has a negative effect on mobility in vivacity and natural morphology of sperm, (Nielsen et al., 2013) observing that men in Norway who are waiting for their first child at an increased age are a heterogeneous group with more health problems and dangers than younger ones. Also, in the study of (Yang et al., 2015), there is a positive correlation of the sperm telomere length with the age of the parents. In addition, (Humm & Sakkas, 2013) in their review investigates the association of increased father's age with Pfeiffer syndrome, crouzon syndrome, achondroplasia, schizophrenia, referring to (Risch et al., 1987; Malaspina et al., 2001). They also looked at reduced physical fertility in men over 35 years of age, observed among 782 healthy couples referring to (Dunson et al., 2002).

Discouraging results show and the study by (Liu & Case, 2011) linking increased age with autism, increased risk of miscarriage and schizophrenia, and studies by (Almeida Ferreira Braga et al., 2011) showing that their “data demonstrate a correlation between paternal age and the incidence of nuclear vacuoles, as well as an effect of large and small vacuoles on late embryo development” and (Reutter et al., 2011), who observe diseases in the urinary system (bladder exstrophy-epispadias complex). (Hammiche et al., 2011), observed that increased age is detrimental to sperm quality and (Jenkins et al., 2013), that global sperm DNA methylation patterns increase with age, raising questions about the dangers caused by increased parentage. Also (Kaarouch et al., 2018) mention that SGD (sperm genome decays) analysis showed increased DNA fragmentation; chromatin decondensation and sperm aneuploidy rates in the APA (Advanced Paternal Age) group.

Finally, statistical analysis of the results suggests that the age of 40 should be considered as the APA cutoff during ART attempts.

In contrast to the study of (Begueria et al., 2014) “Paternal age is associated with a decrease in sperm quality, however it does not affect either pregnancy or live birth rates in reproductive treatments when the oocytes come from donors <36 years old and ICSI is used.” (see Niedeberger, 2015, commentary from the Begueria et al., 2014 study). Tsai et al., 2013 did not find any risk in the ICSI results when deflated spermatozoa of men ≤ 40 years of age were used. In the review of (Sagi-Dain, Sagi, Dirnfeld, 2015) there is no correlation of age with results from ova donation. Also, the study by (Wu et al., 2015) reports that when the woman is under 30, the increased father's age does not affect fertility rates, fetal quality, the price of miscarriages. The study of (Sagi-Dain, Sagi, Dirnfeld 2016) also finds no correlation between increased age and fertility (by oocyte donation), but it is note that their study is based on few studies some of which are yielding conflictive results.

Association denial of man aged with birth results states and the study of (Ghuman et al., 2016). Also, the (Braga et al., 2012) study finds that father's age is not associated with aneuploidy. In case report of (Taitson et al., 2012), two healthy twins are born from a 81-year-old father. Deny correlation finds and a study by (Nijs et al., 2011; Wu et al 2016) which does not find an age correlation with pairs of ICSI circles.

Same results were found in the (Meijerink et al., 2016) study, ie find no correlation with early IVF cycles. In the (Kitzman, 2016) study, 27 health care providers were asked about how they decide to repulse the cutoff from being a father because of his age. Providers usually rated the age of the father in relation to the mother's age. They also investigated his state of health. A provider did not take into account the age of the father at all, arguing that otherwise age does not prevent one from becoming a father in a natural way. While another provider pointed out that there was always the “cliché” of the 30-year-old woman and the 75-year-old man. The only cases that prevented the man from becoming a father were when the woman was old. One clinic reported that they were interested in one parent to remain alive to raise the child. For these reasons they aggregate the ages of the parents and these

should not be more than 80, 90,100 or 110 (corresponding values given by four providers). The study states that providers are affected by various events to make their decisions. Some leave the dilemma for the patient himself, that is, he will decide whether to become a father or not. Providers do not "judge" just ask. And let patients give the answer. They also take into account the interest of the child, and as such, parents consider seeing their child become adult (as 21). Table 1 at the end of the manuscript summarizes the results.

Discussion

From the above results it is possible that healthy children can be born to older men through assisted reproduction. But is it enough to have healthy children or are there any additional factors that need to be taken into account in order for the use of assisted reproduction in elderly men to be regarded as ethical? Likewise is it ethical for a man of advanced years to decide to become a parent? Some providers justify the father's advanced age if the mother is young (Kitzman 2016). On the other hand there are various social problems that (Nielsen et al., 2013) identified namely men in Norway expecting their first child in old age were found to be a heterogeneous group with more health problems and dangers than their younger counterparts. Could it be argued that a child's cohabitation with his elderly parents limits his social rights? Does it violate the child's rights to health, in particular mental health and the right to a satisfactory life? In addition is a doctor responsible for allowing an elderly man to bring into the world a child who may face social and mental problems due to a possible parental problem due to his/her increased age? (Nielsen et al 2013). The European Convention on Human Rights recognizes the right of men and women to paternity and maternity. As defined in Article 12 of the European Rights Convention "Men and women of marriageable age have the right to marry and to found a family according to the National Laws governing the exercise of this right." Article 12 does not impose an upper age limit for the founding of a family but refers to the national laws of each individual country. Most European countries set upper age limits for women, but not for men, for assisted reproduction. For example, in Greece as stipulated by article 4 of Law 3305//2005; The methods of IYA apply to adult persons until they are no longer of physical reproductive age.

Where the assisted person is a woman the age of natural reproductive ability shall be regarded as her 50th year. The basis for encouraging men to become fathers in old age comes from their natural ability to become fathers in old age as opposed to women whose capacity ceases naturally over time. In the Kitzman 2016 study above, this argument was used. Since a man can naturally become a father in old age why should he not become one using assisted reproduction? The difference lies in the fact that the decision of a man who naturally becomes a father in old age belongs solely to him while in assisted reproduction the doctor also plays a part in the decision. The physician in this case has to perform an additional task namely the protection of the child while he is a minor. Family Law has an over riding principle that of the minor child's interest. The doctor must, on one hand, weigh the right of the person to become a father, and on the other hand, the right of the child to live with healthy parents able to stand by him not only until he reaches adulthood but also in his later life. The argument of some authorities that they regard as sufficient the ability of the parent to live long enough to see their child reach adulthood [age 21] is actually in the interests of the parent and not in the interest of the child. The child does not, as if by a miracle, stop needing his parents the day he reaches 21. Naturally it follows that the interests of the child must be in accordance with the social, ideological and religious conditions of each country. Under no circumstances should men be judged on their financial status or their educational attainment.

Conclusion

The doctor's role in the decision of men to become fathers in old age is catalytic. The doctor must fill the gap that exists and also protect the right of the minor child to a dignified living, apart from assisting the child in the care of his or her servant. In the above studies, (Kaarouch et al., 2018;Liu et al., 2011),stated that from age 40 , while (Chapuis et al., 2017) stated from age 51 and (Garcia Ferreyra et al., 2015)from age 50 that it was found that there were problems with fertility and assisted reproduction However in 12 other studies they found no problems occurring in people similar ages.

Summarizing the above

1 Taking into account the right of someone to become a father at an advanced age where he will according to the usual course of events be

able to take care and support his child even after he has reached adulthood

2 Taking into account that according to studies when parents are of advanced age they face various health and social problems (Neilsen et al., 2013)

3 Taking into account the right of the minor child to live in a healthy and safe environment

4 Taking into account that the rights of a minor override the rights of the person to become a father

In our opinion, a man over 60 years of age, the age at which normally health problems begin to appear, must have access to all the necessary information and he must study in depth the chances, difficulties and weaknesses of each choice open to him so that in conjunction with the rights of his as yet unborn child and with the constant support of the doctor a decision which is fair to all can be reached.

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AUTHOR	SUMMARY RESULT	COUNTRY	POPULATION
1. Begueria et al 2014	No correlation when the donor is under 36 years, although there is a decrease in sperm quality with increasing age.	Spain	4887 oocyte donation cycles
2. Braga et al 2012	No correlation found with aneuploidy	Brasil	190 ICSI circles/ 440 embryos
3. Chapuis et al 2017	decreasing levels of success when the man is over 51 and the woman over 37	France	859 IVF and 1632 ICSI cycles
4. de Almeida Ferreira Braga et al 2011	nuclear vacuoles	Brasil	50 patients under ICSI
5. Elhanbly et al 2015	a negative effect on mobility, vivacity and the natural morphology of sperm	Egypt	85 men under ICSI
6. Garcia-Ferreya et al 2015	The increased father's age in rounds with eggs' donation causes increased DNA fragmentation, sperm aneuploidy rates in embryos. It refers to fathers over 50 years old.	Peru	286 embryos
7. Ghuman et al 2016	No correlation with risks even for male sperm's donors over 45 years of age	G.B.	46.078 circles / 7.104 women with sperm's donors
8.Hammiche et al,2011	The increased age is harmful in sperm's quality	Holland	227 men under IVF/ICSI
9. Humm, Sakkas 2013 They refer inter alia to the study of Risch et al 1987, Malaspina et al 2001, and Dunson et al 2002	Pfeifer syndrom, crouzon syndrome, achondroplasia, schizophrenia, reduced physical fertility in men over 35 years old.	several	review
10.Jenkins et al, 2013	Global sperm DNA methylation patterns increase with age, raising questions about the dangers caused by increasing age of father.	USA	15 sperm donors / 22 controls / 41 blood donors
11. Kaarouch et al 2018	increased DNA fragmentation; chromatin decondensation and sperm aneuploidy rates in sperm genome decays. The age of 40 should be considered for cutoffs during Assisted Reproduction	Morocco	83 pairs under IVF

12. Kitzman 2016	Various Ethical Issues	USA	27 assisted reproduction providers (ART) / 10 patients
13. Liu et al 2011	autism, increased risk of miscarriage and schizophrenia. Men over the age of 40 need to be advised about these dangers.	Canada	
14. Meijerink et al, 2016	No correlation of age with pregnancy outcomes through IVF	Holland	7246 first cycles
15. Niederberger , 2015	Comments on the study of Buegeria R et al 2014	-----	-----
16. Nijs et al 2011	No association with levels- results of fertility	Belgium	278 patients in the first IVF cycle
17. Nielsen et al 2013	Health problems and risks for the fathers	Norway	14.832 men waiting for their first child in old age
18. Reutter et al 2011.	Diseases of the urinary tract (bladder exstrophy-epispadias complex)	Europe, America	441 patients
19. Sagi-Dain, Sagi, Dirnfeld 2015	no correlation of age with results from eggs' donation to fertility including pregnancy and births.	Various countries	Review of 12,538 cases of egg donation
20. Sagi-Dain, Sagi, Dirnfeld 2016	no correlation of age with the results from egg donation to fertility. But some studies find autosomal dominant disorders, impaired neurocognitive development, increased risk of adverse postnatal manifestation	Israel	-----
21. Taitson et al 2012	Birth of healthy twins by 81year old father	Brasil	-----
22. Tiegs et al 2017	no correlation of age with IVF results	USA	573single thawed euploid embryo transfers / 473 patients
23. Tsai et al 2013	No hazard in ICSI results when deferred sperm men were used ≤ 40 years	Taiwan	212 ICSI circles

24. Wu et al 2015	No associate when the woman is under 30 years of age. Increase risks with increasing mother's age.	China	9,991in vitro fertilization (IVF) cycles
25. Wu et al 2016	no correlation of age with ICSI couples with the results of pregnancy. However, it finds a correlation with the number of high-quality embryos.	China	2,627 ICSI/ circles
26. Yang et al 2015	sperm telomere length	China	418 couples

TABLE 1. RESULTS **Dark red:** No associate found with a risk **Green:** Old age correlation with some danger
Light red: Study of how providers are cut-off