

Study on The effect of magnetic and electrical fields on fetal sexing

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Abstract

Magnetic and electrical fields in addition to causing mental and physical illness can also affect fertility and fetal sex. The study on over 106 employees working in distribution, transmission and generation of electricity in the Khuzestan (South West Iran) province showed that employees who are at risk of permanent fields have fewer male children while Based on these studies, the employees who live away from the electrical equipment have more boys. The results of this study can strengthen the hypothesis of electric and magnetic fields effects on fetus sex.

Keywords: electrical and magnetic fields, fertility, fetus sex, sons.

1. Introduction

Sperm after getting into a woman's uterus moves upward. In the meantime if there's an ova in the uterus, fertilization occurs through the merging of two gametes and fetus is formed. If this fetus is implanted inside mother's womb, it leads to the pregnancy and the birth of the baby; otherwise it will be excreted from the body. Men produce two types of gametes: X and Y-bearing gametes these two gametes are on the chromosome 23 and women produce one type of gamete which is X bearing gamete on the chromosome 23. If the X bearing gamete of the man is fertilized by X bearing female ova the child will be a girl and if the Y-bearing sperm is fertilized by X bearing female ova the child will be a boy.

So here we see that the child's being a boy or girl depends on man, not the woman and the man is the one who determines the gender of the fetus. In perfect conditions the chance of being a boy or girl is the same and it depends on which sperm reaches the ova to fertilize it. According to statistical data 104 boys are born for every 100 girls but perfect conditions rarely happen in natural conditions and many factors affect the chance of x or y bearing sperms' fertilization. These factors can affect demographic balance in communities and make the country face demographic crisis with lower birth of one sex. Studies conducted in some countries indicate that the ratio of men to women is 1.06 to 1 in normal conditions is declining dramatically. The investigations revealed that in Canada and the USA from 1970 onwards the male population declined significantly. In Denmark, the ratio of men to the total population was reduced from 0.515 to 0.513 in 1950 and in Netherlands it was reduced from 0.516 to 0.513 in 1994. The situation was the same in Germany, Norway and Finland (Davis et al. 1998). Surveys show that factors such as fertilization, nutrition, diseases, environmental conditions and climate, pollution and job type, etc. can affect women's having son or daughter and disrupt demographic balance.

One of the causes about the effect of which on the change of sex of the fetus and even infertility extensive studies is carried out is the father or mother's type of job. Because of pollution in the work environment the sexual power of men and women is at risk. One of them is the electric and magnetic fields pollution. Several studies conducted done on the subject indicate that electric and magnetic fields not only undermine their sexuality in men (Falahati et al. 2011) but also lead to mental and physical disorders in people (Sarifikard et al. 2010)(Baqaeikhah. 2009)(Zamanian. 2008). Limited studies conducted on the gender change imply these malicious fields reduce the birth of boys (Irgens et al. 1997). While some researchers do not believe in the fact that electric and magnetic fields can change the gender.

To find out the truth or falsity of this important issue, this study has conducted field studies on the male staff working in electricity companies based in Khuzestan province who are constantly exposed to electric and magnetic fields. The results are considered as a signal in demographic balance disruption.

2. actors influencing fetal sex determination

2.1. Sperm and fertilization features

One of the important issues that would determine the sex of the fetus is different sperm features. In other words X bearing sperms as the female generators are different from Y bearing sperms as the male generators in terms of velocity of movement, living environment, survival and... These differences, along with differences in oocyte membrane, uterus conditions and many well-known environmental factors mark fetus gender.

Researchers have found that x bearing sperms are slightly bigger than Y bearing sperms. So, x bearing sperms are slower due to their greater size. On the other hand, the uterus PH conditions which is naturally slightly acidic affect the lifetime of the sperms. Y bearing sperms are less durable in the uterus. Instead female generator sperms live longer in an acid environment. Mother's ovulation time and the act of fertilization also play an important role in determining the child gender. If fertilization occurs than 12 hours of ovulation the child is more likely to be a boy. However, due to lower Y bearing sperm viability, if fertilization occurs one day after fertilization the child is more likely to be a girl. Therefore, it is important to know the time of ovulation which is not easy. From the biological point of view every woman's ovulation depends on genetic and acquired features, however based on a general physiological principle ovulation occurs in the middle of menstruation cycle (approximately 13 to 15 days after the first day of the last menstrual period) but the exact time is unknown (<http://nurs.rzb.ir/Forum/Post/15>).

2.2. Nutrition

It was believed in the past that parents' nutrition can have an important role in determining the fetus gender even before pregnancy. However this is not proven yet. Based on these beliefs, pregnant women who want to have a boy should have plenty of fruit, vegetables and green leaves. It is better to provide their protein by eggs, dried fruits and nuts instead of meat. In addition the use of oil, dairies and coffee should be minimized because they reduce acidity. Drink plenty of water is also important that women should consider it. According to this theory as the uterus acidity is higher the child is more likely to be a girl and as the acidity is reduced the child is more likely to be a boy.

Fathers who want to have boys should have 9 mg zinc in their daily diets. Some believe that men who want to have boys should drink coffee 10 to 15 minutes before fertilization to increase the possibility of creating male embryos (<http://lahzehnama.ir/fa/news/4874>).

2.3. Diseases

Unfortunately there is not enough information about the fact the role of disease in determining the sex of the fetus and most studies are focused on the disease developed during pregnancy and after it. However, according to studies conducted at the University of Kent in England by Doctor Sarah Jones, unhappy and complainant women have girls (<http://www.lahaonline.com>). Also Doctor Mehr Oktaei a gynecologist in Iran believes stress and depression among women increases the chance of having girls. Studies at Harvard University suggest that women who are infected with hepatitis B virus are 1.5 times more likely to have girls than the women who are not infected with this virus (<http://www.tanzimekhanevadeh.com/social-issues/346-1389-02-26-15-05-51>).

2.4. Environmental pollutions

Environmental pollutions play an important role in miscarriage, decreased sperm quality, gender change and fetus disease. Brain disorders and reduced birth weight are the most common causes of these factors (Calderon-Garciduenas et al. 2011) (Gouveia et al. 2004) (Mohorovic et al. 2010) (Pires et al. 2011).

(Terrell et al. 2011) In 2011 found that there are less boys in areas contaminated by metals such as lead while the same study also showed that pesticides that pollute the environment for different reasons lead to reduced male population. Research conducted in Sao Paulo Brazil showed that there is a direct

relationship between high levels of air pollution and changes in sex distribution in sperm. The results showed that in the city of São Paulo male to the total population ratio (SSR) in places where air pollution concentration is higher is 1% or 1180 men lower than the less polluted areas (Lichtenfels et al. 2007).

2.5. Smoking

Tobacco use during pregnancy or at any other time is not safe for women. Any smoking during pregnancy exposes the fetus to risks such as low birth weight, respiratory problems, brain disorders including brain paralysis, retardation and learning problems, some birth defects, premature births and even the baby's death. Scholars have found that parents who smoke cause the fetus to die if it is a boy and increase the possibility of having a girl and the baby girl in case of being born has a risk of having cancer two times more. This was examined on more than 9000 pregnant women between 1998 and 2003. The results show that mothers who smoke during pregnancy, have 1/3 lower chance of having a son. Another point is that if in addition to the mother the father smokes, the chance of having a son is reduced by 50% and this is due to higher sensitivity of the male fetus to the destructive effects of smoking and in cases that the fetus is male, the risk of abortion increases significantly. Experts believe that the reason of this fact is the effect of chemical materials in nicotine on the chromosome of sperm and their destruction (<http://www.pezeshk.us>).

2.6. Geographical conditions

Statistics show that Chinese women have the highest number of male children and Filipino mothers are in second place. However Native Americans have female children more. In Iran 104 girls are born for every 105 boys and this rate is 113 boys versus 100 girls in China and South Korea (<http://www.tanzimekhanevadeh.com/social-issues/346-1389-02-26-15-05-51>).

"Figure 1" presents the sex ratio of the population in many countries in 2013. In this map the countries shown in red have higher rate of female population, the countries shown in blue have higher rate of male population and the purple countries present the sameness of female and male population (<http://fa.wikipedia.org>).

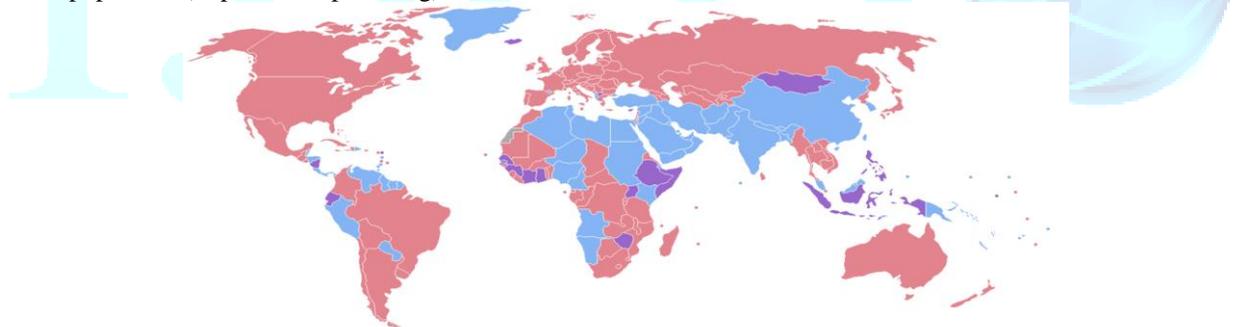


Figure 1: Map of the sex ratio of the population in different countries

2.7. Job type

There is no doubt that fathers and mothers' job plays a determining role in the fetus sex. Different types of pollutions such as inhalation and contact with gases and toxic metals, pesticides, parasites and electric and magnetic fields in the job environment can affect sexual strength and children gender (Ryan et al. 2002).

(Yang et al. 2002) Conducted studies on the sexual balance of petrochemical industry in Taiwan between 1987 and 1996 the result of which indicated the lack of sexual balance among their children. Also the exposure of male staff to non-ionizing and ionizing radiation in radiology centers reduced the birth of boys among them (Metrecia et al. 2011).

3. The effect of electric and magnetic fields on fetal sex determination

All the people are constantly exposed to electric and magnetic fields at work and in school which is the result of generation, transmission and the use of electricity. "Table 1" and "table 2" present the electric

and magnetic fields existing in our living environment (Electric and Magnetic Fields and Your Health Information on electric and magnetic fields associated with transmission lines, distribution lines and electrical equipment. 2013).

Table 1: magnetic fields in different places

Location	Magnetic field
High voltage power lines	$0.5 - 5 \mu T$
Power grid	$0.05 - 2 \mu T$
Power substations	At a distance of 5 m from the equipment $0.1 \mu T$
Ground substation of distribution transformer	At a distance of 2-3 from the transformer $0.1 \mu T$
fuse box	At a distance of 1-2 m $0.1 \mu T$
Home or office	$0.05 - 0.15 \mu T$
Appliances	At a distance of 30 cm $0.05 - 5 \mu T$

Table 2: electric fields in different places

Location	Magnetic field
High voltage power lines	$0.3 - 3 \text{ kv/m}$
Power grid	$0.01 - 0.1 \text{ kv/m}$
Power substations	$>0.1 \text{ kv/m}$
Ground substation of distribution transformer	$>0.1 \text{ kv/m}$
fuse box	At a distance of 1-2 m $0.01 - 0.03 \text{ kv/m}$
Home or office	$0.003 - 0.03 \text{ kv/m}$
Appliances	$0.01 - 0.05 \text{ kv/m}$

To evaluate the effect of these fields on the determination of sex of the fetus studies were conducted on 148 children of employees of power companies in Khuzestan province that are constantly exposed to electric and magnetic fields. All the staffs are exposed to electric and magnetic fields at least twenty days per month and 8 hours per day. Since there are several companies with different voltage levels, for a closer look at three distribution, transmission and generation companies were selected and studies were conducted on the children of their employees. The questionnaires given to individuals included questions on the number of children and their gender. It is noted that in order to achieve accurate results the children who were born before their employment in the company were removed from the study.

3.1. Impact of electric and magnetic fields on determining the sex of the children of employees of the electricity distribution companies

The maximum working voltage of employees of the company is 33 kV. 14 employees working as a linesman in the distribution company completed the questionnaire. They had 25 children the gender segregation of which is according to "Figure 2".

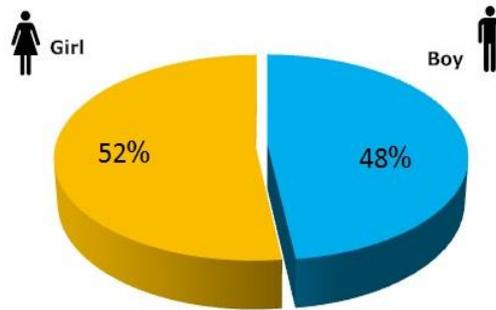


Figure 2: gender segregation of Electricity distribution companies' employees' children

Among 25 studied children 13 were female and 12 were male. Gender balance in the company applies in the company even though the girls have narrowly the larger share.

3.2. The effect of magnetic and electric fields on determining the sex of the children of employees of power plant (power generation)

Power plants consist of several sectors with different voltage levels. Command room, electricity substation, precision instruments, and laboratory ... are different parts of the plant. In order to investigate the effect of magnetic and electric fields on children's gender here the employees of a steam power plant were studied. 102 subjects participated in this study. Their operating voltage was between 6 and 230 kV with the working times between 8 to 12 hours. They had 175 children and their gender segregation is presented in "Figure 3".

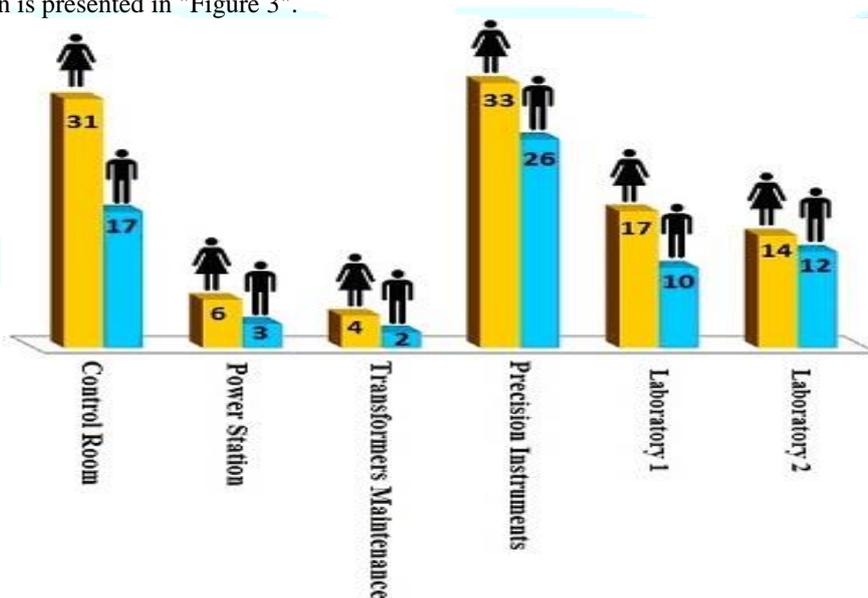


Figure 3: Gender segregation of the employees in different parts of power plant

In the control room and precision instruments 26 and 35 people participated in this study respectively. Their operating voltage was 18 kV with working hours of 8 hours a day. As is clear from "Figure 4" the number of girls is more than boys. In other sectors the situation is the same. In the power substation of the plant and transformers' maintenance where operating voltage was 230 kV, a total of 12 employees were studied, and the results showed that the number of female children was twice greater than male children. But the most important part of the plant is the laboratory. In this part two groups are working. The first group is constantly exposed to the fields in order to take samples of boiler water and power generator. The group consists of 15 subjects. The number of their female children is more than their male children. 3 out of these 15 subjects were always responsible for boiler water and generators sampling who were more exposed to the field. A higher percentage of their children were female. The first subject had 5 children including 4 girls and 1 boy. The second subject had 3 children including 2

girls and 1 boy and the third subject had 3 girls and 1 boy. However the difference between male and female children of other employees was not so different and girls were few percent more than boys.

The second group including 14 subjects was at a distance of 300 to 400 meters from the generator and unlike the first group in the laboratory they did not need to be present near electrical equipment to take samples. This group had 26 children including 14 girls and 12 boys. The point is that the difference between their male and female children was lower than the first group which was constantly exposed to magnetic and electric fields.

Case studies in other sectors are also significant. For example, there were 7 employees in the mover part of the plant. One of the employees had more traffic around the generator than others. This employee has two daughters. The important thing is that by comparing him with the children of his two brothers we found that his two brothers have 3 sons and have no daughters. His brothers work out of the plant which indicates the influence of magnetic fields on determining fetus gender.

4. Conclusion

Looking at the results of this study it can be found that being in electric and magnetic field is effective in determining fetus gender. 106 employees had 200 children 59% of which i.e. 118 subjects were female and the rest were male. The most important part of this study is that by comparing the children's gender in sectors such as Lab 2 (power generation) located at a distance from the rest of the equipment with the rest of employees who were constantly exposed to magnetic and electric fields due to their job, we can find out the effect of these harmful fields on the reduced male fetus population.

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