

Human Embryo's Sex determination: A Comparative Study of Quran, Hadith and Science

Social Sciences

Nosheen Zaheer¹ & Najia Almas²

Abstract

This paper aims to explore the purpose and approach of Quranic verses that deal with the topic of human embryo's sex determination. It will further facilitate the comparison of the Islamic (Quran and Hadith) knowledge of human embryology with the criticism of western scholars who have a contradictory opinion of embryology. In this regard the role of men and women reproductive substance in determining the sex of the embryo will be traced from religious and scientific perspective that constitutes the first stage of human embryology. After this first stage, comparison at genetic and gonad level is done.

Key Words:, Embryo, Embryology, Genetic, Gonads. Sex determination

Introduction

The credibility of Religion are challenged by human rational reasoning from time immemorial and the history of every religion, has generally withstood the burden of this phenomenon and Islam has borne it particularly. The approaches of rationality and reasoning at the time of their emergence were not recognized as scientific approaches but during the period of enlightenment these were identified as crown of all approaches. This period was characterized with scepticism, emergence of atheism and irreligion (Haakonssen, 1996). This period further makes road for replacing revealed religion through natural religion (Sorkin, 2008). This gradual shifting, from beliefs system (faith) to rationalism and empiricism, raised many question to the authenticity of religious texts. The whole scheme of revealed books confines the

¹ Assistant Professor Islamic Studies Department Sardar Bahadur Khan Women's University Quetta, Pakistan. (nosheenirma@gmail.com).

² Lecturer, Sardar Bahadur Khan Women's University Quetta, Pakistan.

implementation of these reasoned and rational scientific approaches to that revealed text that deals with the domain *Aqali* argumentation (Rafiabad, 2007). Where, *Aqali* domain includes variety of topic having the range from beginning of the universe to the creation of man.

The Quran and hadith elaborate the topic of creation of man not only in the field of embryology rather it also diverts the attention of the reader towards the process that yield male or female phenotype from genital material. This occurrence is equally recognizing in embryology with the terminology; Sex determination of human embryo. The question is, do these two domains apparently being two different fields (Quran and Science) of knowledge, address this issue in the same context?

The Quranic objectives of addressing this topic appear to have different scenario that firstly, affirms *qudra* (authority) and sovereignty of Allah as a sole Creator. Secondly, through this topic Quran addresses its rational audience generally and *Mushrikeen* (non-believers) and *yahood* (Jews) of Makkah particularly. The Makkans (inhabitants of Makkah) were not ignorant of oneness of God but their beliefs were corrupted with *shirk* resulting their rational approaches denying their resurrection. The Quran adopted this scientific approach to invite people towards the concepts of monotheism and resurrection by focusing their attention on their own creation. While on other hand science has no concern with God and his supremacy. It rather focuses, regarding this topic to reveal the hidden knowledge regarding different stages of human creation.

It is obvious from the above discussion that Quran and science share no common ground in addressing this issue but does the knowledge provided by these two different sources are compatible with each other? The precision and accuracy of the knowledge of the two sources can be checked through the comparison made by the sequential stages of human sex determination.

Sex Determination

The term sex determination denotes all the stages involved in determining the sex of an embryo inside the mother's womb. The very first step of this journey is fertilization where sex chromosomes play decisive role in sex determination and so this stage is termed as chromosomal sex determination. The second step proceeds with the switching on of genes that constitutes the second stage of sex determination at gene level. This stage further facilitates the differentiation of previously undifferentiated bipotential sex organs into respective male and

female organs. This phase is named as sex determination at gonadal level.

While in Quran and hadith one finds the signs of this topic in scattered form but a thorough reading provides with the knowledge on this topic well. Quran also mentions the first stage of fertilization in disclosing the role of male and female reproductive substance in determining the sex of embryo. While the unrivalled authority of deciding the embryo's sex resides with the Will of Almighty Allah.

Quranic Sex determination of Embryo

Quran identifies this multistage process from the beginning with the ejaculation of male reproductive substance (semen) during fertilization and Quranic has a different approach from science perspective. Quran clearly mentions that besides a tool man has no authority in selection of embryo's sex. It is only the will of Almighty Allah that finally destined the embryo as male or female. In other words the unique creator Allah has the authority to originate, create and arrange life. A great Muslim scholar Al Razi has discussed the same truth that the act of His creation is different from others (Robinson, 1991). Because "He is bringing something into existence that did not exist before" (Hassan, 2013).

While regarding the human contribution of sex determination Quran liberates woman from this responsibility. In Surah An-Najam Allah Almighty says; "And He created the two sexes male and female from a drop when ejaculated (*tumna*)."

In the above mentioned verse of Holy Quran the word "*tumna*" is derived from the root word "*manī*" that literally denotes the meaning of shedding, emitting, ejaculating (sperm) (Wehr's, 1952). All the meanings of the "*tumna*" are pointing towards the fact that male reproductive substance has the sole responsibility of determining embryo's sex. In other words it can be said that Almighty Allah has shown flexibility to women for the responsibility of determining embryo's sex. And Woman role and contribution has been mentioned in Surah al Baqarah 223 as;

"Your Wives are a tilt un to you."

In the above mentioned ayah Allah Almighty is symbolically comparing woman with tilt because tilt signifies the area where cultivation is done by sowing seed. Tilts not only protect the seed but it rather preserves the nature of seed and gives it nourishments and growth. Quranic symbols here

assigning woman the duties and responsibilities of procting, preserving the nature and sperm (male or female) and also supporting the growth and nourishment of embryo inside her. The hadith of Sahih Muslim also summaries the duties of male and female in sex determination as;

Thauban, the Prophet's (P.B.U.H.) slave, said:

“The reproductive substance of man is white and that of woman (i. e. ovum central portion) yellow, and when they have sexual intercourse and the male's substance (chromosomes and genes) prevails upon the female's substance (chromosomes and genes), it is the male child that is created by Allah's Decree, and when the substance of the female prevails upon the substance contributed by the male, a female child is formed by the Decree of Allah”(al-Hajjaj, 2009, p. 221).

This hadith is a detail account of the nature and participation of male reproductive substance in fertilization. According to science male has two sex chromosome; one X and second Y chromosome. Male receive this X chromosome from her mother and Y chromosome from his father. During spermatogenesis¹ man has ability to produce these two types of chromosomes. In the process of fertilization, usually one chromosome participates. If X chromosome is participating in fertilization, then according to above mentioned hadith female gamete prevails male that results in female child while on other hand if Y chromosome becomes participant in fertilization them male gamete prevails female that result the birth of male child.

Consecutive Sages of Sex Determination in Hadith and Embryology

Ahadiths of Prophet (P.B.U.H.) mention sqin al-Bukhari and Muslim elaborates the satges of sex determination as in chapter 33, Hadith 6391 of Sahih Muslim it is written,

“This hadith has been reported on the authority of A'mash with the same chain of transmitters and in the hadith transmitted on the authority of Waki' (the words are): ‘The creation of any one of you is like this that (semen) is collected in the womb of the mother for forty nights”(al-Hajjaj, 2009, p. 1583).

Another version of this Hadith is noted from Hudhaifa in chapter 33, hadith 6329 of Sahih Muslim in the following words;

¹ The process that enables man to produce gametes (sperms) of two types that either carrying X chromosome or Y chromosome.

Hudhaifa b. Usaid reported directly from Allah's Messenger (May peace be Upon him) said that "when a drop of the (semen) remains in the womb for forty or fifty (days) or forty nights, the angel comes and says: My Lord, will he be good or evil? And both these things would be written. Then the angel says: My Lord, would he be male or female? And both these things are written. And his deeds and actions, his death, his childhood; these are also recorded. Then his document of destiny is rolled and there is no, addition to and subtraction from it" (al-Hajjaj, 2009, p. 1583).

The above mentioned Aḥadith comprises of two important points

- 1) Embryo's fate of being male nor female cannot be decided before forty or forty two days
- 2) The embryo's sexual organs before these forty or forty two days are in undifferentiated stage and the process of differentiation will begin after forty or forty five nights.

Dr. Lactantius criticised this hadith and raised two objections as discussed below;

"Sex is actually determined at the moment of conception according to whether the fertilized egg has two X-chromosomes (female) or an X and Y chromosomes (male)"(Najmi).

- (1) "There is some ambiguity about the age of the embryo when the angel appears (Hudhaifa b. Usaid reported that Muḥammed said 40 or perhaps 50 days, not 42, and Abu Tufail maintains that Muḥammed said to Hudhaifa b. Usaid that sperm resided in the womb for 40 days). No wonder the angel has to wait for forty-two days before it learns the child's sex. In reality, prior to 7 weeks of gestation the ovaries and testes appear identical and the external genitalia only start to diverge around 9 weeks"(Najmi).

While putting forward the objections, Dr. Lactantius seems to ignore the most important chronological developmental link of each forerunner stage to its successor stage explained in Quran, Aḥadith and science during sex determination of human embryo. Embryology defines the process of sex determination as a pathway that starts from chromosomal sex and culminate in gonadal sex (Ramon Pinon, 2002, p. 78). The significance of chromosomal composition cannot deny as it constitutes the preliminary point of embryo's sex determination but clinically it is proved that sex cannot be decided on it's merely composition. Clinical records reveal men having genotype of XX and

similarly women with XY genotype and this phenomenon is scientifically termed as sex reversal (Ramon Pinon, 2002, pp. 4-5).

The careful examination of this sex reversal facilitates individuals to understand the structure of Y chromosome that is composed of two arms; one short and second long arm. The short arm contains SRY gene that is responsible for testis formation while long arm's generates the spermatogenesis (Eberhard Nieschlag, 2010). The SRY expression initiate between days 41 and 44 post-fertilization in humans fetus for normal testis formation (Adam H. Balen, 2004). The mystery of sex reversal is also related to the SRY gene. The sex reversal of XX male and XY female are due to two reasons firstly, due to transfer of SRY gene that contains portion of (Testis Determining Factor) of Y chromosome to X chromosome in the result of abnormal crossing over.¹ Secondly, due to the mutation² in the locus³ that would further represses testis determining factor (G. S. Gupta, 2005). It is evident from the above scientific facts that genetically sex can be determined at fertilization while gonadogenesis rely wholly on the presence of SRY gene that commence its working between 41 and 44 days. Further it facilitates the process of gonadal differentiation (testis or ovaries in 8th to 9th week) (Cummings, 2014): Testicular development (testis formation) that started during the 8th week reaches to its culmination in 9th week (Sytsma, 2006). Indifferent gonads of 42 days embryo (Sean Kehoe, 2009) gradually transforms to embryonic ovary before 45 and 55 days (S. Gupta, 2011). The above mentioned scientific information affirms the same time of gondaogenesis that is mentioned in Ahadith with the reference of angle arrival.

Conclusion

Thus, it can be concluded that Quran and Aḥadith are sketching the different stages of human embryos sex determination in mother's womb in a chronological order from semen, genetic level to gonadal level. In the whole process the man's role is no more than an instrument to fulfill the decree and authority (*qudra*) of Allah. Although the purpose and approach of Islam towards this topic concerns mainly the establishment of Allah's authority as one supreme creator having powers to create man after his death. And the purpose of scientific approach is embedded in revealing the information through practical knowledge. Instead of these differences the information provided by Islam and Science overlaps each other on each stage.

¹ The exchange of genetic material between the homologous (similar) chromosomes during meosis.

² Change in genetic information (DNA).

³ The specific position of the gene on chromosome.

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