

Attitude of a Muslim Scholar at Human Embryology

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Summary

George Sarton, a professor of Science History at Harvard University, stated in his book "The Life of Science" that the foundations of science were laid for us by the Mesopotamian civilizations whose scholars and scientists were their priests; and to them we owe the foundations of medicine, navigation, astronomy and some mathematics. The second development came through the Greeks, as taught in the traditional way in Western schools and colleges. The third stage of development, however, is to be credited to the meteoric rise of Islam, whose Abased caliphs drank avidly at the fountain of the ancient Persian, and Hindu, as well as Greek sources of knowledge. For nearly four hundred years Islam led the scientific world as from one end of Islam to the other, from Spain to India, the great body of past knowledge was exchanged between her scholars and the torch 'carried forward with new discoveries. Scholars of Christendom from about the eleventh century were mainly occupied for over two hundred years in re-translating from Arabic into Latin. Thus Islam paved the way for the Renaissance, which in turn led to science's fourth great development in the modern western world.

From that exalted position, the Muslims stand presently at the lowest rung of the ladder of nations, possessing colonial minds with brain washed non-Islamic attitudes and practices in science. The causes for such decline and the reasons for the present day standing of the world-Ummah of Islam are eloquently described by the late Ismail R. Faruqi (1). To regain our glorious past and heritage, we must start Islamization of attitude and practice in Science. The attitude of Al-Qur'an is very scientific. It encourages mankind to think, to reflect and to investigate all Natural Phenomena. The Qur'anic revelations do not negate the modern scientific truths, which have come to light in many areas of human knowledge. Maurice Bucaille in his book "The Bible, The Qur'an and Science" (2) shows how Qur'anic revelations are in agreement with modern science in the areas of cosmology, geology, astronomy, animal and vegetable kingdoms, and human reproduction. The Islamic spirit, which prevailed during the meteoric rise of Islam, should be instilled in all the Muslim children of the Muslim World from Primary School to the University level.

This Islamization of science should inspire the young Muslim minds to become the torch bearers who can push forward the frontiers of Science to regain the Islamic heritage of Excellence and Mastery in all Sciences.

One of the practical methods of achieving this is that when books and textbooks of Science are written by Muslim Scientists and Scholars (who are presumed to possess sound Islamic knowledge and Islamic spirit), each chapter should start with one or more pertinent verses from the Qur'an, Sahih Hadith or quotations from eminent Muslim Scientists or Scholars. Where appropriate the Qur'anic verses should be elaborated with modern scientific knowledge in the text of each chapter. In this paper the author presents material on Human Embryology to prove that modern scientific knowledge confirms the revelations in the Holy Qur'an and how these revelations should be incorporated in the Textbooks for Muslim students. The following presentation is only a work plan and each chapter is not complete.

Key Words: Embryology, History of Medicine, Human Embryos

Embryology before qur'anic revelations

The first recorded embryological studies are in the books of **Hippocrates** (460 - 377 BC). He wrote on the nature of chicken embryos. **Galen** (2nd century AD) wrote a book called "**On the Formation of the Fetus.**" in which he described the placenta and fetal membranes. It appears that the fact that human beings are developed in the uterus (womb) has not been known until the 15th century. The first known illustration of a fetus in the uterus was drawn by **Leonardo da Vinci**. The Physicians in the 7th century AD did not know that the human embryo is developed in stages. However in the fourth century BC **Aristotle** had described the stages of development of the chick embryo. The fact that the human embryo develops in stages was not discussed and illustrated until the 15th century.

In 1673 **Leeuwenhoek** discovered a simple microscope and described the early stages of the chick embryo. Until 1941 the staging of human embryos was not described.

The foregoing could be included in the introduction or Chapter 1 of the Textbook on Human Embryology for Muslim students (see Table 1 for the contents of the Textbook).

Chapter 2: Fertilization

"Then He made his seed (sperm) from a draught of despised fluid"

Surah 32: 8

"Hath not man seen that We have created him from a drop of seed (sperm)?"

Surah 36: 77

He it is Who fashioned you in the wombs as pleaseth Him.

Surah 3:6, 18:37, 22:5

Allah created you from dust, then from a little fluid, then He made You pairs 9 the male and female)

Surah 35: 11

He it is Who created you from **dust**, then from a drop (of seed), then From a leech-like clot.

Surahs 40: 67, 75: 37-38

Lo ! We create man from a drop of thickened fluid to test him; so We Make him hearing and seeing.

Surah 76:2

From a sperm-drop, He hath created him, and then mouldeth him in due proportions.

Surahs 80: 19, 82: 7-8

So let man think from what he is created. He is created from a gushing fluid that is issued from between the loins and ribs.

Surah 86: 5-7

Verily, We fashioned man from a small quantity of mingled liquids (gametes i.e., ovum and sperm)

Surah 76: 2

Fertilization is the sequence of events that begins with contact between a sperm and an ovum. Fertilization usually occurs in the outer third of the uterine tube. The fertilized ovum goes into successive divisions. The embryo's sex is determined at fertilization by the kind of sperm (X or Y) that fertilizes the ovum.

Of him (human male who has X or Y chromosome sperm) He (Allah) created the male and female.... 75:36 (This is a great scientific statement in the Qur'an with regard to sex determination).

And that he createth the two spouses, the male and female. From a drop of sperm when it is poured forth

Surah 53: 45-46

He bestows (children) male or female according to His will. ...42: 49-50

Chapter 3: Implantation

Have We not created you from a fluid (held) despicable? Which We placed in a place of rest (uterus) firmly fixed for a period (of gestation) determined (according to need). Surah 77: 20-23

The fertilized ovum by successive divisions forms a ball called blastocyst or blastula (0.1 mm in diameter). The blastula reaches the uterus from the uterine tube gently moved by the cilia of the uterine tube itself in four or five days and lied free for a further two days before it clings and gets implanted in the

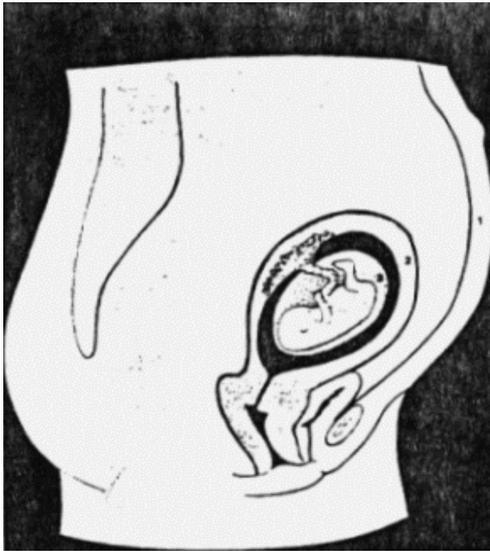


Figure 1- Drawing of a sagittal section of a female's abdomen and pelvis showing a fetus in utero. The "veils of darkness" are (1) the anterior abdominal wall; (2) the uterine wall, and (3) the amniochorionic membrane.

uterine wall. The most suitable site of implantation is the upper third of the posterior wall (Fig. 1).

Ibn Hajar al-Asqalani, in his book "**Fatah Albary Sharah Sahib Albokhari**" writes that when the semen enters the womb, it remains for six days before it is supported by the womb (3). He also quotes **Ibn al-Qaim** (13th century) who said "When the semen enters the womb it forms a ball-like structure which remains for six days before it attaches itself to the womb." (3).

Then We placed him as a drop in a place of rest. **23: 13**

In this verse the word drop or *nutfā* is interpreted to mean zygote by **Moore** (4). He further says that this interpretation is supported by another verse (77: 2) in the **Qur'an** which states that "a human being is created from a mixed drop." The mixed drop is interpreted as a zygote formed by the union of a mixture of sperm and ovum. The zygote divides to form a blastocyst, which is implanted in the uterus ("a place of rest").

Created man, out of a (mere) clot of congealed blood.
Surah **96: 2**

Moore (5) says that an implanted blastocyst or a spontaneously aborted conceptus would resemble a blood clot.

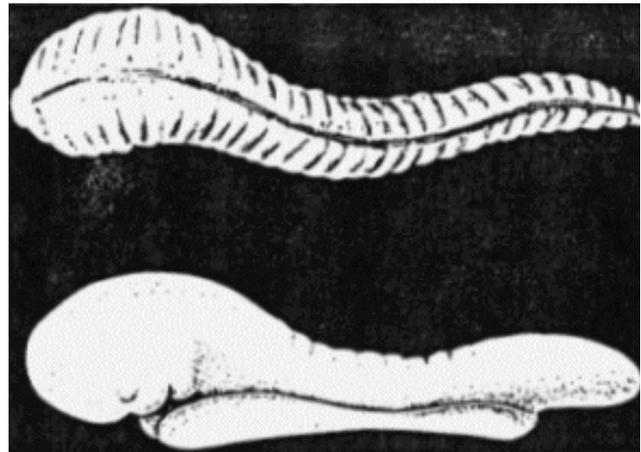


Figure 2- Top, a drawing of a leech or bloodsucker. Below, a drawing of a 24 day-old human embryo. Note the leech-like appearance of the human at this stage.

Chapter 4: Trilaminar Embryo

He makes you in the wombs of your mothers, in stages, one after another, in three veils of darkness.

Surah **39: 6**

As stated earlier the staging of human embryos was not described until 1941.

The three veils of darkness were explained by the commentators of the **Holy Qur'an** (4,6) to be (i) the anterior abdominal wall, (ii) the uterine wall; and (iii) the amniochorionic membrane (Fig.1).

Al-Bar (6), has made an interesting observation and states that each of these three layers is further made up of three consecutive layers. The abdominal wall is made up of the external oblique sheet of muscle, followed by the inner oblique muscle, and the transversus muscle.

The wall of uterus is made up of the epimetrium, the myometrium, and the endometrium.

The sac layers, which surround the embryo, are made of the amnion, the chorion and the decidua. Decidua or pregnant endometrium does not participate in the formation of the placenta. This membrane falls during parturition (delivery of the baby), therefore it is called decidua i.e., temporary and not permanent. It is the part that is shed during either menstruation or delivery.

Chapter 5: Embryonic Period

Then We made the drop into a leech-like structure

(alaq), then of that leech-like structure, we made a chewed lump. then We made out of the chewed lump, bones, and clothed the bones with flesh, then We developed out of it another creature.

Surah 23: 14

The word Alaq in the Qur'an has two meanings. One meaning is something that clings or attaches to something else. This refers to the process of clinging, attachment and implantation of the blastocyst in the compact layer of the endometrium. This amazing process is revealed to man through the Qur'an 14 centuries ago, long before any man knew anything about it.

The second meaning of alaq refers to a leech or blood sucker. The human embryo clings to the endometrium of the uterus, in the same way that a leech clings to the skin. In the same manner as the leech derives blood from the host, the human embryo derives blood (nutrition) from the decidua or pregnant endometrium. Figure 2, shows the remarkable resemblance between a 23-24 days human embryo and a leech. At the time of this Qur'anic revelation in the 7th century, the physicians were not aware that the human embryo had a leech-like appearance. They could not verify this statement as there were no lenses or microscopes available.

Then of that leech-like structure (alaq), We made a chewed lump

(Mudhghah). 23: 14

The Arabic word "mudhghah" means chewed substance or chewed lump. If one looks at a human embryo which is four weeks old, then it looks like a chewed lump of flesh (Fig. 3). The chewed appearance results from the somites which resemble teeth marks. The somites are the bases from which the greater part of the axial skeleton and musculature develop (7).

The Qur'an declares: "Then We made out of the chewed lump, bones, and clothed the bones with flesh." 23: 14

The bone formation precedes muscles. This is true both in the vertebral column and in the limb bones. This astoundingly in accordance with embryological development. First the bones form as cartilage mod-

els and then the muscles (flesh) develop around them from the somatic mesoderm.

"Then out of a piece of chewed flesh, partly formed and partly unformed." 22: 5

This verse indicates that the embryo is made up of both differentiated (formed) and undifferentiated (unformed) tissues. For example, when the cartilage bones are differentiated, the embryonic connective tissue or mesenchyme around them is undifferentiated. It later differentiates into the muscles and ligaments attached to the bones (4).

Surah 23: 14 continues with the words "Then We developed out of it another creature."

One of the arguments of the theory of Evolution is that the embryos of animals and humans look alike; therefore man evolved from lower animals.

The above quoted words of Qur'an implies that the bones and muscles result in the formation of another creature. This may refer to the human-like embryo, which is formed at the end of the eighth week. At this stage it has distinctive human characteristics and one can see that it possesses the primordia of all the internal and external organs and parts. After completion of eight weeks, the human embryo is classified as a fetus. The Qur'anic verse may be referring to this as the new creature.

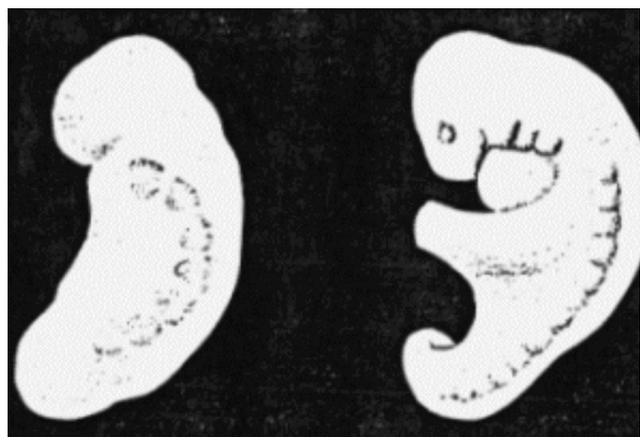


Figure 3- Left, a plasticine model of the human embryo, which has the appearance of chewed flesh. Right, a drawing of a 28 day-old human embryo showing several bead-like somites which resemble the teeth marks in the model shown to the left.

“And He gave you hearing and sight and feeling and understanding” ----32: 9

This verse tells us that the faculties of hearing, seeing, and feeling are bestowed upon us in this order. Embryologists confirm that this is exactly the order of development of special senses. **Moore** (4) further confirms that the primordia of the internal ears appear before the beginning of the eyes, and that the brain, which is the site of understanding, differentiates last.

Surah 23: 14 could be quoted in the beginning of Chapter 14 and Chapter 15 on Skeletal System and Muscular System respectively.

Chapter 19: Full Term

“And We cause whom we will to rest in the wombs for an appointed term” -12: 5

“Who created you and fashioned you in due proportion and gave you any form He willed” ... 82: 7-8

And fashioned you and perfected your shapes, and bath provided you with good things.” 40: 64

In the above verses **Allah (SWT)** says that He is the one Who determines which embryos will remain in the womb until full term. It is well known to embryologists that in the first month of development many embryos are aborted some due to genetic malformations, and that only about 30 % of the zygotes formed, develop into fetuses that are born at full-term. Allah (SWT) says in Surah XLII, verses 49-50, that He determines the sex of the embryo whether it becomes a boy or a girl and what genetic and somat-

ic characteristics (height, color, shape, size, beautiful or ugly, etc.) it will be endowed with.

Conclusion

The foregoing is only an action plan and step by step methodology which is presented as a guide for textbook writers on human embryology for Muslim students.

The correct interpretation of verses pertaining to human embryology in the **Holy Qur’an** would not have been possible 14 centuries ago or even a 50 years ago. The science of human embryology today is quite advanced thanks to modern electronics and instrumentation. This has enabled us to interpret and understand the Qur’anic verses better. As our knowledge increases in the future, then other verses in the Holy Qur’an pertaining to human development will be better understood.

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