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Quranic Description of Human Creation and Its Correlation with Embryology and Immunological Protection

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Abstract

The Holy Quran and Hadith give a clear record of how human beings were created until their full development; there was limited scientific knowledge on embryology during this time. This paper discusses the relationship of the Quranic accounts on embryonic development with the current scientific discoveries in embryology and fetal immunology. The Quranic verses and prophetic stories describe the progressive stages of human development, which start with the formation of clay and mixed fluids (sperm and ovum), implantation in a secure uterine environment, early embryonic stages as alaqah (clinging clot) and mudghah (chewed-like lump), osteogenesis and myogenesis and the subsequent infusion of the soul after 120 days. In the modern science, these stages are proven by fertilization, implantation, organogenesis and fetal maturation, and through immunological research, the protective actions of the placenta and maternal immune system in protecting the developing fetus. It has been shown that there is astonishing agreement between the Quranic narrations and the modern knowledge focusing on the physical and the spiritual aspect of human creation. Moreover, the study states the possibility of interdisciplinary studies on the boundaries of theology, developmental biology, immunology, and showing the specific and multidimensional concept of the Quran of human development that can be identified in the modern scientific language.

Keywords: Quran, Embryology, Immunology, Human Creation, Fertilization, Clinging Clot, Alaqah and Mudghah

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Introduction

Holy Quran and Sunnah presented a detailed account of the development of human beings since gametes and conception to the actual birth and delivery of a full-term human being in times when the science was not highly developed. These Quranic descriptions have corrected superstitious and vague concepts on human development. They can emphasize that human creation takes place in intentional sequential steps in the womb which has baffled scholars since it was revealed 1400 years ago but still relates to certain ideas of modern embryological knowledge[1]

The Quran provides an elegant account of creation, growth, and stages of developmental processes of intra-uterine life, which Muslims were aware of in the 7th century, and the Ahadeeth (sayings, actions, approvals) had been narrated by the Prophet Muhammad of almost everything related to the events of natal and even postnatal fact. When these findings were delivered to the scholars in the science of Anatomy and Embryology, they were surprised because these experts knew that the information provided to the Prophet Muhammad was actually divine. [2]

Creation of human this is an extremely curious subject of the history of Embryology It was an awful long time before science was able to get the process of fertilization (as early as a century ago). As one of the early disciplines, embryology can be studied in Hindu religious texts like Bhagvata Purana, Garbha Upanishad and Sushruta Samhita (the earliest book on Surgery), Pre-Socratic and the Hippocratic periods. The first to experimentally explain the development of a chick was Hippocrates and thus, vaguely explaining the development of Human. Aristotle wrote in the following works in detail about the development of human being after Hippocrates. Scientists such as Harvey, Leonardo De Vinci, and Fabricius among others later performed dissections and described the embryo as it develops. Subsequently scientists such as Leeuwenhoek and Malpighi wrote on the topic and validated the idea of preformationist. The ovum

[1].Abdul-Majeed, A. A. (2012). Embryology in the Quran: A scientific-linguistic study. JKAU: Islamic Econ., 25, 183-216
[2] Saadat, Sabiha. "Human embryology and the holy quran: an overview." *International journal of health sciences* 3, no. 1 (2009): 103.

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formation cycle of a female mammal was found as late as the 19th century. The development of embryo in the human body is talked about in several verses of the Quran and descriptions of the Islamic Prophet (so-called Hadith). As the knowledge in the sphere of Embryology is underdeveloped, there is the need to reconsider such meanings of those verses and narrations and to connect them with the modern science.[3],[4]

Although numerous works have been conducted to analyze Quranic accounts of human embryology and its comparison with contemporary biological results, few works have been conducted to determine the correlation between Quranic embryology and immunological protection.

Immunological mechanisms do not allow maternal immune rejection and promote the growth of the human embryo during gestation.[5] The placenta is a selective fence that regulates the exchange of nutrients and antibodies and attacks the fetus against pathogens.[6] Decidually located maternal immune cells are tolerant to the fetus and reactive to infections.[5] Antiviral defense in the placenta is regulated by Type I interferon signaling which indicates a complex set of innate immune mechanics at work prior to birth. These natural defenses are consistent with Quranic revelation characterizing of safety, development, and divine protection over the human being in the womb. These kinds of correlations also lead to more studies into the point of convergence of faith, embryology, and immunology.[7]

Research Objective

- To answer the question on how the Quran narrates the way human beings were created since the time of conception up to the full development of a human being.

[3] Bashir, Imtiaz, Azal Ikhlaq, Huniya Binte Riaz, Farhat Ijaz, and Khurram Aftab. "The Matter of Formation of Human Being Described By the Holy Quran In Comparison With the History of Embryology." *Journal of Islam and Science* 7, no. 2 (2020): 73-78.

[4] Mohammad, Ali. "Qur'an on Embryology: A Study of Qur'anic and Modern concept of Human Development." *Journal of Islam and Science* 7, no. 1 (2020): 31-38.

[5] Erlebacher, Adrian. "Immunology of the maternal-fetal interface." *Annual review of immunology* 31, no. 1 (2013): 387-411

[6] Narang, Kavita, Elizabeth H. Cheek, Elizabeth Ann L. Enninga, and Regan N. Theiler. "Placental immune responses to viruses: Molecular and histo-pathologic perspectives." *International journal of molecular sciences* 22, no. 6 (2021): 2921.

[7] Ding, Jiahui, Anthony Maxwell, Nicholas Adzibolosu, Anna Hu, Yuan You, Aihua Liao, and Gil Mor. "Mechanisms of immune regulation by the placenta: Role of type I interferon and interferon-stimulated genes signaling during pregnancy." *Immunological reviews* 308, no. 1 (2022): 9-24.

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- To explain the embryo stages of development that were discussed in the Quran and the hadith.
- To demonstrate that the Quran discusses the safeguarding of the growing fetus in the womb.
- To draw comparisons between Quranic narratives and modern day science on the subject of embryology and immunology.
- To demonstrate the connection of the physical growth with the spiritual creation, as stated in the Quran.

Research Question

1. In what ways did the Quran relate the creation of the human beings since conception up to full development?
2. What are the embryonic stages of Quran and Hadith?
3. What would be the similarities between the embryology described in the Quran and what the science says?
4. The protection of the developing fetus as the Quran explains, and what is the comparison with the modern immunology?
5. Why is the knowledge of Quran important in examining both physical and spiritual creation of human beings?

Research Methodology

The paper relies on the literature review, gathering the Quranic verses, Hadith, Tafseer, and other contemporary scientific articles regarding embryology and fetal immunology. An analogy was then made in order to compare the correlations of the description provided in the Quran and modern scientific discoveries.

Literature Review

Quranic Perspective on Human Creation:

The holy Quran provides a detailed explanation of human creation, from the earliest stage of life to full human development.

وَلَقَدْ خَلَقْنَا ٱلْإِنسَـٰنَ مِن سُلَـٰلَةٍ مِّن طِينٍ۔ ثُمَّ جَعَلْنَـٰهُ نُطْفَةً فِى قَرَارٍ مَّكِينٍ۔ ثُمَّ خَلَقْنَا ٱلنُّطْفَةَ عَلَقَةً فَخَلَقْنَا ٱلْعَلَقَةَ مُضْغَةً فَخَلَقْنَا ٱلْمُضْغَةَ عِظَـٰمًا فَكَسَوْنَا ٱلْعِظَـٰمَ لَحْمًا ثُمَّ أَنشَأْنَـٰهُ خَلْقًا ءَاخَرَ ۚ فَتَبَارَكَ ٱللَّهُ أَحْسَنُ ٱلْخَـٰلِقِينَ۔

And indeed, We created humankind from an extract of clay, then placed each ˹human˺ as a sperm-drop in a secure place, then We developed the drop into a clinging clot, then developed the clot into a lump ˹of flesh˺, then developed the lump into bones, then clothed the bones with flesh, then We brought it into being as a new creation. So Blessed is Allah, the Best of Creators.[8]

[8] https://quran.com

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The word sulalah (سُلَٰلَةٍ) can be translated as the pure extraction of clay. It relates to the first starting material used to create the Prophet Adam and after that it also mean the vital part found in human sperm. Modern science support this idea. It reveals that humans derive their biological substance from both parents. These nutrients originally come from the earth directly or through the food chain and later help in making sperm.[9]

Fertilization and early embryonic development:

The Quran also explain the fertilization process in Surah Al-Insan (76:2), and says that

إِنَّا خَلَقْنَا ٱلْإِنسَـٰنَ مِن نُّطْفَةٍ أَمْشَاجٍ نَّبْتَلِيهِ فَجَعَلْنَـٰهُ سَمِيعًۢا بَصِيرًا

For indeed, we alone created humans from a drop of mixed fluids, in order to test them, so we made them hear and see.[8]

Tafseer explain that this mixed drop refers to the sperm and ovum that combine to form the zygote. [9]According to modern embryology, fertilization occurs when the male and female cell (gametes) fuse in the upper part of fallopian tube. The sperm then enter the outer covering of an egg and then fuse with the egg membrane. Afterward sperm nucleus enter the egg and fuses with the egg nucleus. This give rise to a new cell having a full set of chromosomes known as diploid zygote.[10]. The Quran reference to mixed fluids align with the modern scientific knowledge highlighting it accuracy, even centuries before science discover this

Clinging and Chewed-like Stages: Alaqah and Mudghah

ثُمَّ جَعَلْنَـٰهُ نُطْفَةً فِى قَرَارٍ مَّكِينٍ

Then placed each human as a sperm-drop in a secure place

After fertilization, the location of the seminal drop in a safeguarded location, “fi qarar makin” is explained in Surah Al-Muminun (23:13) [8]. Tafseer states that the womb is a secure and safe place, and its barrier is solid, where the fertilized egg implant and begin to develop.[9]

[9] Ahmed, Israr. Bayan-ul-Qur’an. Lahore: Markazi Anjuman Khuddam-ul-Qur’an, n.d.
[10] Siu, Karen K., Vitor Hugo B. Serrão, Ahmed Ziyyat, and Jeffrey E. Lee. "The cell biology of fertilization: Gamete attachment and fusion." *Journal of Cell Biology* 220, no. 10 (2021): e202102146.

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Scientifically, after attachment to the uterus, the human embryo fully embeds into the endometrium. The motherly immune response changes this lining into decidua, supplying nutrient, providing immune tolerance which matches with the qur'anic statement of a "protected place".[11]

ثُمَّ خَلَقْنَا ٱلنُّطْفَةَ عَلَقَةً فَخَلَقْنَا ٱلْعَلَقَةَ مُضْغَةً فَخَلَقْنَا ٱلْمُضْغَةَ عِظَٰمًا فَكَسَوْنَا ٱلْعِظَٰمَ لَحْمًا ثُمَّ أَنشَأْنَٰهُ خَلْقًا ءَاخَرَ ۚ فَتَبَارَكَ ٱللَّهُ أَحْسَنُ ٱلْخَٰلِقِينَ۔

Then We developed the drop into a clinging clot, then developed the clot into a lump ˹of flesh˺, then developed the lump into bones, then clothed the bones with flesh, then We brought it into being as a new creation. So Blessed is Allah, the Best of Creators

Surah Al-Muminun (23:14) describes the first phases of embryo; it begins with the following transformation of the seminal drop; it transforms into clinging clot (alaqah), followed by a chewed like lump (mudghah).[8]

A cling, tafseer clarifies that the cling is a minute structure that is attached to the uterine wall, which emphasizes the process of attaching the early embryo during the development process, and not the clotted blood. This meaning is comparable to the qur'anic wording of earlier stages of embryo. [9]

The stages of mudghah matches up with somitogenesis, partitioning, and the initial structure of the embryo. During this stage, cells start to differentiate, and the earliest from of organ appear. This step-by-step developmental pattern explain in the Quran is similar to what modern embryology shows, how pluripotent cell lose their totipotency ability and specialized into organ and tissues.[12] It further elaborates by the Quran that the lump of tissue from first into bones and is then covered by muscle and flesh.

Modern science indicates that distinct precursor cell from the mesoderm first transform into flexible cartilage and then into bone. When the bone start to develop further, this process is referred to as myogenesis. The mesoderm differentiate into the muscle fiber, and additional fiber is added at later stages and this is controlled by various signals

[11] Muter, Joanne, Vincent J. Lynch, Rajiv C. McCoy, and Jan J. Brosens. "Human embryo implantation." *Development* 150, no. 10 (2023): dev201507.
[12] Geng, Xin, and Guillermo Oliver. "Elucidating the molecular characteristics of organogenesis in human embryos." *Genome biology* 11, no. 8 (2010): 130.

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within the embryo. The exact order also describe in Quran and it agree with what modern embryology and developmental biology explain.[13],[14](skeletal muscle and myogenesis article)

Lastly, the complete human being is formed as a new creature, layers at a time in three level of darkness, as presented in Surah Al-Mu'minun (23:14).

Abdullah bin masud reported that prophet Muhammad (صلی اللہ علیہ وسلم) said who is the most truthful :

إِنَّ أَحَدَكُمْ يجمع خلقه في بطن أمر اربعينَ يَوْمًا تُطْفَةً ، ثُمَّ يَكُونَ عَلَقَةً مثل ذلك ، ثُمَّ يَكون مُضْغَةً مثل ذلك ، ثُمَّ يُرْسَل إليه الملك فينفخ فيه الروح

Verily your creation is on this wise. The constituents of one of you are collected for forty days in his mother's womb in the form of blood, after which it becomes a clot of blood in another period of forty days. Then it becomes a lump of flesh and forty days later Allah sends His angel to it with instructions concerning four things, so the angel writes down his livelihood, his death, his deeds, his fortune and misfortune (shahi muslim : 6723)[15]

The hadith explain that the embryo's physical development is completed, and Allah gives it a soul after 120 days. A fully formed human being develop from a developing body. The embryo is alive from fertilization, but this stage shows how spiritual awareness and human identity are added, making human different from other living thing

خَلَقَكُم مِّن نَّفْسٍ وَٰحِدَةٍ ثُمَّ جَعَلَ مِنْهَا زَوْجَهَا وَأَنزَلَ لَكُم مِّنَ ٱلْأَنْعَـٰمِ ثَمَـٰنِيَةَ أَزْوَٰجٍ ۚ يَخْلُقُكُمْ فِى بُطُونِ أُمَّهَـٰتِكُمْ خَلْقًا مِّنۢ بَعْدِ خَلْقٍ فِى ظُلُمَـٰتٍ ثَلَـٰثٍ ۚ ذَٰلِكُمُ ٱللَّهُ رَبُّكُمْ لَهُ ٱلْمُلْكُ ۖ لَآ إِلَـٰهَ إِلَّا هُوَ ۖ فَأَنَّىٰ تُصْرَفُونَ ٦

He created you all from a single soul, then from it He made its mate. And He produced for you four pairs of cattle. He creates you in the wombs of your mothers in stages, one development after another, in three layers of darkness. That is Allah your Lord! All authority belongs to Him. There is no god worthy of worship except Him. How can you then be turned away?

يَخْرُجُ مِنۢ بَيْنِ ٱلصُّلْبِ وَٱلتَّرَآئِبِ ٧

[13] Yang, Yingzi. "Skeletal morphogenesis during embryonic development." *Critical Reviews™ in Eukaryotic Gene Expression* 19, no. 3 (2009).
[14] Bentzinger, C. Florian, Yu Xin Wang, and Michael A. Rudnicki. "Building muscle: molecular regulation of myogenesis." *Cold Spring Harbor perspectives in biology* 4, no. 2 (2012): a008342.
[15] 1. Muslim ibn al-Ḥajjāj, Ṣaḥīḥ Muslim, Hadith no. 6723.

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Stemming from between the backbone and the ribcage

The Quran also explains how the fetus is protected. Humanity is formed in stages, one layer at time, in three level of darkness as explained in Surah Az-Zumar (39:6). It is said that humans are interposed between the ribcage and the backbone as in Surah At-Tariq (86:7) [8]

Scientifically, the placenta gives the baby essential nutrition, oxygen, important hormones and protection from harmful substance. The maternal fetal connection stop harmful microbe entry, carefully send antibodies and nutrient and help the mother's body accept fetus, even though it is partially different from her. Mother to child passing of maternal antibody IgG through passive immunity is also used to assist the newborn to resist infection. The fetus immune system develop slowly and later get support from adaptive immune responses. The Quran's explanation of layers of protection and development matches the scientific explanation of how the body naturally protect and support the growing fetus.[16]

Overall, human creation explained by modern science closely matches with qur'anic description. It defines the stages made from clay and mixed fluid, to being safely placed in the womb, initial embryo development as alaqah and mudghah, first bone form and then flesh, the creation of new human when the soul is given and the protection of fetus all of which matches with modern science about fertilization, implantation, embryo growth, bone and muscle development and fetus immunity. The Quran indicates that how the Quran combine physical, spiritual and functional aspect of humans, highlighting its precision and eternal value, and how it matches modern scientific knowledge.

Discussion

The results of the research indicate that most of the principles that the Quranic narrative of the process of human creation and development described are also considered in the

[16] Chucri, Thaís Martins, J. M. Monteiro, A. R. Lima, M. L. B. Salvadori, JR Kfoury Junior, and Maria Angélica Miglino. "A review of immune transfer by the placenta." *Journal of reproductive immunology* 87, no. 1-2 (2010): 14-20.

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works of modern embryology and fetal immunology that have been discovered during the past century. Even though the Quran was given over 1400 years ago, its descriptions of conception, implantation, embryonic staging, organ development and protection of the fetus has been found to comply with scientific findings through microscopy, imaging, and molecular biology. This discussion reveals such relationships and describes their importance both in the scientific and spiritual aspects.

The initial most important fact to be found in the results is the sequential account of the creation of humanity presented in the Quran, beginning by the word Sulalah (extract), then the mixed drop (nutfah amshaj), the structure of clinging (alaqah), the form of the chewed (mudghah), and, lastly, the complete human being. This development is confirmed in modern embryology. The existing scientific sources confirm that the embryo actually exists in definite phases: fertilization, cleavage, blastocyst, implantation, gastrulation, somitogenesis, organogenesis, and fetal maturation. The words in which the Quran explains alaqah and mudghah are associated with the second and the third week of the embryos developmental behavior. These similarities are used to maintain that the interpretation of writings in the Quran is true, systematic and scientifically consistent.

The fact that the Quranic reference to a secure resting place (qarār makīn) is similar to the current scientific concepts of implantation and immune tolerance is another significant finding. Recent immunology research supports the notion that extraordinary alterations take place in the uterus following implantation: decidualization, immune reprogramming and the formation of a protective maternal fetal interface. In the contemporary immunology, it is known that the immune system of the mother has selective tolerance toward the fetus, although it harbors antigens of the father, in a variety of ways such as regulation T cells, placental barriers, HLA expression, or anti-inflammatory cytokines. These processes are quite consistent with Quranic account of a secure, safe and guarded environment that the embryo growing in the womb is given.

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The Discussion also points to the correspondence between Quranic accounts on how the bones are formed then covered by muscle and the current concept of osteogenesis and myogenesis. Developmental biology proves that preceptor cells of mesoderm, first modeled into cartilage, transform to bone. Thereafter muscle fibers grow in alignment with the Quranic account of the bones being covered with flesh. These arguments prove that the Quranic account is in the right sequence of biological account reported by the modern scientific studies.

Besides the physical development, the Quran and the Hadith differentiate the physical growth and the occasion when the ruh (soul) is breathed to the fetus. In spite of the fact that science does not speak about the spiritual aspect, contemporary studies recognize the essential developmental milestones such as neural formation, early brain development, EEG patterns and fetal awareness. Human identity, concept that it is comprised of physical and non-physical items, is consistent with the teachings of Quran, which demonstrate that human creation is a biological and spiritual endeavor.

One of the major themes that come to light as a result of this study is the combination of embryology with immunology. Recent studies indicate that in addition to being a nutritional and respiratory system, the placenta acts as a sophisticated immune system. It blocks infection of the pathogens, provides fetal antibodies, and prevents rejection. Such biological defense is equivalent to the Quranic description of development in three levels of darkness and the focus on divine protection. The correlations show that the anatomy of the Quranic descriptions is not limited to the anatomy and denotes well-known protection mechanisms that science learned only recently.

Another importance of studying the Quranic embryology in the contemporary scientific environment is evident in this research as well. The comparison shows that faith and science do not oppose each other, they complement and enrich each other. Quranic verses promote contemplation, exploration and acknowledgement of divine creation. The analysis compares those passages with the existing biological facts, which helps the study to conclude that the Quran does not just offer spiritual direction but also challenges

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the audience to scientific investigation. The accuracy of the Quranic language has always stimulated scientific interest and inspired scientists to seek greater ways in which revelation and empirical evidence can be related.

The other valuable conclusion that has been made during this discussion is the possibility of interdisciplinary research in the future. Most of the studies are on simple embryology, whereas less is available on the immunological defense that is mentioned in religious literature. The subject matter provides a possibility of interdisciplinary study both in theology and developmental biology, immunology, and medical ethics. The natural understanding of how the fetus is safeguarded can also be used to enhance the contemporary maternal-fetal medicine, e.g. avoiding miscarriages, immune diseases, and fetus infections.

All in all, the results of this study have shown that the Quranic accounts of the development of a human being are in concordance with the scientific findings in the field of embryology and immunology. The correspondence of sequences, anatomic discoveries, defensive mechanisms, and the pattern of development are all strikingly similar showing an unparalleled agreement between scripture and present-day scientific evidence. These parallelisms indicate that Quranic embryology is an advanced and precise version of human creation even before the invention of scientific equipment. They also demonstrate the multidimensional approach of the Quran to the human development, including its physical, functional, spiritual, and protective dimensions in a manner that is still pertinent and scientifically significant.

Conclusion

The Quranic explanation of human development, conception to full development, is closely related to the contemporary embryology and immunology, and includes phases i.e. mixed fluids, alaqah, mudghah, bone and muscle formation, and fetal protection. It is also combining the spiritual aspect with the infusion of soul and demonstrates that human creation is both physical and metaphysical. This extraordinary coincidence explains how accurate Quran is, how faith and science are not in conflict, and how

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interdisciplinary research may be conducted in order to relate theology with developmental biology and fetal medicine.

References

1. Abdul-Majeed, A. A. (2012). Embryology in the Quran: A scientific-linguistic study. JKAU: Islamic Econ., 25, 183-216
2. Saadat, Sabiha. "Human embryology and the holy quran: an overview." *International journal of health sciences* 3, no. 1 (2009): 103.
3. Bashir, Imtiaz, Azal Ikhlaq, Huniya Binte Riaz, Farhat Ijaz, and Khurram Aftab. "The Matter of Formation of Human Being Described By the Holy Quran In Comparison With the History of Embryology." *Journal of Islam and Science* 7, no. 2 (2020): 73-78.
4. Mohammad, Ali. "Qur'an on Embryology: A Study of Qur'anic and Modern concept of Human Development." *Journal of Islam and Science* 7, no. 1 (2020): 31-38.
5. Erlebacher, Adrian. "Immunology of the maternal-fetal interface." *Annual review of immunology* 31, no. 1 (2013): 387-411
6. Narang, Kavita, Elizabeth H. Cheek, Elizabeth Ann L. Enninga, and Regan N. Theiler. "Placental immune responses to viruses: Molecular and histo-pathologic perspectives." *International journal of molecular sciences* 22, no. 6 (2021): 2921.
7. Ding, Jiahui, Anthony Maxwell, Nicholas Adzibolosu, Anna Hu, Yuan You, Aihua Liao, and Gil Mor. "Mechanisms of immune regulation by the placenta: Role of type I interferon and interferon-stimulated genes signaling during pregnancy." *Immunological reviews* 308, no. 1 (2022): 9-24.
8. https://quran.com
9. Ahmed, Israr. Bayan-ul-Qur'an. Lahore: Markazi Anjuman Khuddam-ul-Qur'an, n.d.
10. Siu, Karen K., Vitor Hugo B. Serrão, Ahmed Ziyyat, and Jeffrey E. Lee. "The cell biology of fertilization: Gamete attachment and fusion." *Journal of Cell Biology* 220, no. 10 (2021): e202102146.
11. Muter, Joanne, Vincent J. Lynch, Rajiv C. McCoy, and Jan J. Brosens. "Human embryo implantation." *Development* 150, no. 10 (2023): dev201507.
12. Geng, Xin, and Guillermo Oliver. "Elucidating the molecular characteristics of organogenesis in human embryos." *Genome biology* 11, no. 8 (2010): 130.
13. Yang, Yingzi. "Skeletal morphogenesis during embryonic development." *Critical Reviews™ in Eukaryotic Gene Expression* 19, no. 3 (2009).
14. Bentzinger, C. Florian, Yu Xin Wang, and Michael A. Rudnicki. "Building muscle: molecular regulation of myogenesis." *Cold Spring Harbor perspectives in biology* 4, no. 2 (2012): a008342.
15. . Muslim ibn al-Ḥajjāj, Ṣaḥīḥ Muslim, Hadith no. 6723.
16. Chucri, Thaís Martins, J. M. Monteiro, A. R. Lima, M. L. B. Salvadori, JR Kfoury Junior, and Maria Angélica Miglino. "A review of immune transfer by the placenta." *Journal of reproductive immunology* 87, no. 1-2 (2010): 14-20.