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تطورات الجنين قبل الولادة: دراسة مقارنة للمناهج الدينية والفلسفية والعلمية

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الملخص

تهدف هذه الدراسة إلى إجراء مقارنة تحليلية لمراحل التخلق الجنيني من وجهتي النظر الدينية والعلمية. تُعد مراحل تطور الجنين منذ لحظة الإخصاب حتى الولادة من الموضوعات محورية الاهتمام في مجالات العلوم الطبية والدينية والفلسفية. ففي العلوم الطبية، يقدم علم الأجنة من خلال دراسة دقيقة لعمليات تكون الجنين ونموه، إسهامات جليّة في فهم تعقيدات الخلق الإنساني. وفي المقابل، أولت الديانات السماوية، ولا سيما الإسلام، اهتماماً بالغاً لمراحل تكوين الجنين ضمن حديثها عن مراحل خلق الإنسان. وقد ورد ذكر أطوار نمو الجنين في القرآن الكريم بمصطلحات دقيقة مثل: النطفة، العلقة، المضغة، العظام، واللحم. اعتمدت هذه الدراسة المنهج النوعي بمنهجية وصفية-تحليلية، لمقارنة الرؤيتين الدينية والعلمية حول أطوار الجنين، متفحصةً نقاط الالتقاء والافتراق بينهما. وتكشف النتائج عن وجود تداخلات كبيرة بين الأوصاف القرآنية والمعطيات العلمية الحديثة، خاصة في مراحل النطفة، العلقة، المضغة، وتكوين العظام. ومع ذلك، تبرز بعض الاختلافات في التفاصيل والتفسيرات، وهي اختلافات تعزى إلى تباين الغايات والمناهج بين الحقلين. كما تتناول الدراسة الأبعاد الفقهية والقانونية والفلسفية المرتبطة بتخلق الجنين، فتتطرق إلى مسائل مثل: وقت نفخ الروح، الحقوق الشرعية للجنين، والرؤى الفلسفية حول مراحل نموه. ويمكن أن تسهم نتائج هذه الدراسة في بلورة فهم أكثر شمولية لعملية التخلق الجنيني، وإثراء الحوار حول التفاعل بين العلم والدين.

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١. المقدمة

تُعدُّ مراحل تخلق الجنين وتحوّله قبل الولادة من الموضوعات متعددة التخصصات التي تقع في دائرة اهتمام العلوم الطبية والدينية والفلسفية. يدرس علم الأجنة، بمنهجية تجريبية وأدوات متطورة، عملية تكوُّن الجنين ونموه بدقة من لحظة الإخصاب حتى الولادة، ساعياً لفك تعقيدات الخلق البشري. في المقابل، تناولت الأديان السماوية، ولا سيما الإسلام، هذا الموضوع من منظور متعالٍ، يحمل أبعاداً توجيهية وتربوية. فقد ورد في القرآن الكريم، بصفته المصدر الديني الأساسي للمسلمين، ذكر مراحل نمو الجنين بمصطلحات دقيقة وعميقة مثل «نُطْفَة»، «عَلَقَة»، «مُضْغَة»، «عِظَام»، و«لَحْم». إن المقارنة بين هذين المنظورين لا تقود إلى فهم أكثر شمولية لهذه العملية البديعة فحسب، بل يمكن أن تسهم في دحض الشبهات، وتعزيز الحوار البناء بين العلم والدين، وإثراء المعرفة الإنسانية. لذلك، هدفت هذه الدراسة إلى تقديم عرض مقارن شامل، وتحليل نقاط التوافق والتباين بين الرؤى الدينية (مع التركيز على القرآن الكريم وتفاسيره المعتمدة) والعلمية حول مراحل تطور الجنين، واستكشاف الأبعاد الفلسفية والفقهية والقانونية المرتبطة بها، ولا سيما المسألة المحورية المتعلقة «بنفخ الروح». ويتحدد السؤال الرئيس على النحو التالي: ما أوجه التوافق والاختلاف بين المنظورين الديني والعلمي لمراحل تخلق الجنين؟

٢. منهجية البحث

اعتمد هذا البحث المنهج النوعي والوصفي-التحليلي. ففي مرحلته الأولى، جرى وصف الرؤى الدينية والعلمية المتعلقة بمراحل تكوُّن الجنين بدقة ومنهجية. ثم في مرحلة لاحقة، أُجريت مقارنة بين هذه الرؤى من خلال تحليل مقارن لتحديد نقاط الالتقاء والافتراق بينها وشرحها. وتم جمع البيانات من مصدرين رئيسيين: المصادر العلمية المعتمدة في مجالات علم الأجنة والطب والفلسفة، بما يشمل الكتب والمقالات وقواعد البيانات المتخصصة؛ والمصادر الدينية، متضمنةً آيات القرآن الكريم والتفاسير المعتمدة كـ«الميزان» و«نمونة» و«مجمع البيان»، والتي دُرست بعناية. واعتمد تحليل البيانات على المقارنة المنهجية لمفاهيم وأوصاف كلا المجالين.

٣. نتائج البحث

أ) نقاط التوافق بين الرؤية الدينية والعلمية

كشــفت المقارنة بين آيات القرآن الكريم ومعطيات علم الأجنة الحديث عن توافق ملحوظ يدل على الإعجاز العلمي في القرآن:

-مرحلة النطفة: يتطابق مصــطلح «نطفة» في القرآن، الدال على أصـــل المادة المائية والمستخلَص، بدقة مع المفهوم العلمي «للزيجوت» (البويضة المخصبة) ومواد التكاثر للذكر والأنثى. وتُمثّل هذه المرحلة في كلا المنظورين نقطة البدء في خلق الإنسان.

-مرحلة العلقة: يقدم وصف القرآن «للعلقة» بمعنى الكائن الحي اللاصق توافقاً واضحاً مع مرحلة «الكيسة الأريمية» علمياً، والتي تنغرس في جدار الرحم. كما أن تشبيه العلقة بالعلق من حيث الشكل الخارجي وإفراز مواد تمنع تخثر الدم، يتسق مع المعطيات العلمية.

-مرحلة المضغة: يقدم مصطلح «مضغة» بمعنى الشيء الشبيه باللحم الممضوغ وصفاً دقيقاً لمظهر الجنين في الأسـبوع السـادس تقريباً بعد الإخصـاب، والذي يصـفه علم الأجنة على أنه كتلة خلوية ذات نتوءات وفراغات تشبه أثر المضغ.

-تشكُّل العظام واللحم: يتطابق التسلسل القرآني («**فَخَلَقْنَا الْعِظَامَ فَكَسَوْنَا الْعِظَامَ لَحْمًا**») مع المعطيات العلمية التي تُظهر تكوُّن الهيكل الغضروفي أولاً ثم تكسوه الخلايا العضلية (اللحم).

ب) أوجه الاختلاف وأسبابها

على الرغم من نقاط التوافق الواســعة، تبقى هناك فوارق بين المنظورين تعود في جوهرها إلى تباين أهدافهما ومناهجهما وأساليبهما:

- عدد المراحل وتفاصيلها: يعرض القرآن مراحل النمو في إطار مراحل أساسية جامعة يسهل فهمها، بينما يقدم علم الأجنة تصــنيفات أكثر تفصــيلاً وتعقيداً، تشــمل مراحل أدق وتفاصــيل خلوية وجزيئية.

-توقيت نفخ الروح: لم يُحدد القرآن الكريم توقيت نفخ الروح تحديداً دقيقاً، مما أفضــى إلى اجتهادات متعددة بين العلماء (كربعه الأربعين أو ما بعد اكتمال الهيكل العظمي). في حين يعجز

العلم التجريبي، بسبب الطبيعة الميتافيزيقية للروح، عن دراسة هذه الظاهرة أو تحديد توقيتها من الأساس، ويعتبرها خارج نطاق اختصاصه.

-الغاية المنشودة: تنصرف الغاية القرآنية من عرض هذه المراحل إلى التأكيد على عظمة الخالق وقدرته وحكمته، والحض على التدبر. في المقابل، تنحصر غاية علم الأجنة في فهم الآليات البيولوجية وبيان الكيفية التي تتم بها هذه العمليات. وبعبارة أخرى، يجيب القرآن عن «اللماذا» بينما يجيب العلم عن «الكيف».

ج) الأبعاد الفقهية والقانونية

يُنظر إلى الجنين في المنظور الإسلامي على أنه كائن ذو قيمة وكرامة إنسانية منذ لحظة انعقاد النطفة. وتقر الشريعة الإسلامية للجنين بعدة حقوق، منها:

-الحق في الحياة: يحرم الإجهاض بشكل مبدئي، إلا في حالات استثنائية قصوى كتعريض حياة الأم للخطر.

-الدية: تُحدد للجنين دية متناسبة مع مرحلة نموه في حال الإجهاض، وتكون الدية كاملة بعد نفخ الروح.

-الميراث: يثبت للجنين حق الإرث من والديه في حال ولادته حياً.

ويختلف هذا المنظور جوهرياً عن المقاربات العلمية المحضة التي قد تعتمد معايير مثل «قابلية الحياة خارج الرحم» أو «النشاط الدماغي» محكاً للتقييم.

د) الأبعاد الفلسفية

تناول فلاسفة الإسلام، كابن سينا وصدر المتألهين، مسألة علاقة النفس بالجسد أثناء النمو الجنيني. فبينما يرى ابن سينا أن النفس تتجلى في الجنين تدريجياً مع اكتمال استعداد الجسد، معتبراً تشكل القلب محطة محورية، يشرح صدر المتألهين، وفق نظريته «جسمانية الحدوث وروحانية البقاء للنفس»، تطورها عبر ثلاث مراحل: النفس النباتية، فالنفس الحيوانية، فالنفس الناطقة. ورغم تقارب هذه الرؤى الفلسفية مع التفسيرات الدينية، فإنها تؤكد على عمق وتعقيد مسألة بداية الحياة البشرية.

٤. الخاتمة

أظهر هذا البحث وجود نقاط توافق بارعة بين أوصـــاف القرآن الكريم لمراحل تخلق الجنين ومعطيات علم الأجنة الحديث. ويتجلى هذا التوافق بشـكل خاص في المراحل الأسـاسـية «لنطفة»، «علقة»، «مضغة» وتسلسل تشكل العظام واللحم، مما يضفي دلالة على المصدر الوحياني للقرآن. مع ذلك، لوحظت بعض الاختلافات في التفاصـيل وعدد المراحل، ولا سـيما في مسـألة «نفخ الروح»، وهي اختلافات ناجمة عن تباين أهداف ومسالك ومجالات دراسة كل من العلم والدين. فالعلم يجيب عن «الكيف» بينما الدين يجيب عن «اللماذا» ومعنى الخلق. وليس هذان المنظوران بالضـــرورة متناقضـين، بل يمكن أن يتكاملا لتقديم فهم شـامل لتعقيدات الخلق البشـري. ومن منظور فقهي وقانوني، يقدم الإســلام، من خلال منحه قيمة جوهرية للجنين منذ بداية تكوينه، إطاراً أخلاقياً وقانونياً لحماية هذه الحياة النامية. ومن منظور فلســفي، تســهم هذه المقاربات في تعميق الفهم لعلاقة الجسد بالنفس ومكانة الإنسان في نظام الخلق. يمكن لنتائج هذا البحث أن تسهم في تقديم فهم أعمق للإعجـاز العلمي في القرآن، وتعزيز الحوار البنـاء بين العلم والـدين، وكـذلـك تطوير أطر أخلاقية وقانونية في القضايا المتعلقة بالجنين، كالإجهاض وأبحاث الخلايا الجذعية. وتُقترح لأبحاث مسـتقبلية إجراء دراسـة مقارنة أعمق مع المسـتجدات العلمية، ودراسـة منهجية للروايات ذات الصـلة، واستقصاء أكثر للأبعاد الفلسفية المتعلقة بالنفس والروح في المرحلة الجنينية.

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Prenatal Embryonic Development: A Comparative Study of Religious, Philosophical, and Scientific Approaches

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ABSTRACT

This study conducts a comparative analysis of the stages of embryonic formation from religious and scientific perspectives. The stages of embryonic growth from conception to birth constitute a significant subject within medical science, religion, and philosophy. In medical science, embryology contributes to understanding the complexities of human creation through a detailed examination of the processes of embryonic formation and development. On the other hand, divine religions, particularly Islam, describe the stages of embryonic formation from a transhistorical standpoint. The Holy Qur'an delineates the stages of embryonic growth using terms such as Nutfah (sperm drop), Alaqah (clinging clot), Mudghah (a chewed lump of flesh), Idhaam (bones), and Lahm (flesh). Using a qualitative, descriptive-analytical method, this research compares religious and scientific viewpoints on the stages of embryonic development and examines their points of convergence and divergence. The findings reveal significant overlaps between Qur'anic descriptions and scientific discoveries, including the stages of Nutfah, Alaqah, Mudghah, and the bone formation. However, differences are also observed in details and interpretations, stemming from the distinct objectives and approaches of these two fields. This study also explores the jurisprudential, legal, and philosophical dimensions related to embryonic development, examining issues such as the time of ensoulment, fetal rights, and philosophical perspectives on the stages of embryonic growth. The results of this research can contribute to a more comprehensive understanding of the process of embryonic development and the interaction between science and religion.

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Introduction

The stages of embryonic formation and development before birth are significant topics in medical science, religion, and philosophy. In medical science, embryology, as a specialized branch, investigates the intricacies and wonders of human creation through a precise and scientific examination of the process of embryonic formation and growth from conception to birth. Utilizing advanced tools, this science sought to discover and understand the various stages of embryonic development, the factors influencing it, and potential anomalies in this process (Sadler, 2007, p. 3).

Similarly, divine religions have also paid particular attention to human formation and creation, providing transhistorical references to the stages of embryonic development in the mother's womb. The Holy Qur'an, as the final scripture, addresses this topic with eloquent and precise language, describing the different stages of embryonic growth using terms such as *Nutfah*, *Alaqah*, *Mudghah*, *Idhaam*, and *Lahm* (Rajabi et al., 2023; Ebrahimi & Fazel, 2012, pp. 76-80).

A comparative study of scientific and religious perspectives on the stages of prenatal growth can lead to a more comprehensive understanding of this complex and astonishing process. Comparing these viewpoints not only aids in a better understanding the Qur'anic verses concerning human creation but also help resolve certain doubts and ambiguities in interpreting these verses (Qaedi et al., 2021; Ebrahimi & Fazel, 2012, p. 76). Furthermore, this comparison can pave the way for greater interaction between science and religion and the utilization of achievements from both domains to enhance human knowledge and understanding (Al Rasool & Taherizadeh, 2010, p. 9).

A review of previous research indicates that studies comparing religious and scientific perspectives on embryonic development have a long history and cover a wide range of topics, including the time of ensoulment, comparative analysis of Qur'anic stages with embryological findings, lexical analysis of Qur'anic terms, and comparisons with other religions and historical theories; despite this breadth, given contemporary advancements in embryology and the necessity of reinterpreting religious texts in light of modern scientific

findings, a research gap persists in this area. This highlights the need for new and innovative studies to elucidate more precisely the connection between religious teachings and scientific progress in embryonic development. Key research gaps identified include a neglect of philosophical dimensions and insufficient attention to narrative sources (*Hadiths*).

These gaps reveal the necessity for studies that adopt a more comprehensive approach, addressing both the philosophical aspects of the topic and the systematic use of narrative sources.

The primary objective of this research is to provide a comprehensive comparison of prenatal developmental stages from religious and scientific perspectives, including an examination of the philosophical, jurisprudential, and exegetical dimensions of this subject. To achieve this aim, the present study analyzes the philosophical and ethical aspects of embryonic development, examines jurisprudential views on the stages of embryonic development and the time of ensoulment, and offers a more precise interpretation of Qur'anic verses on embryonic development based on scientific findings and authentic narrations.

Given the importance of the stages of embryonic development in scientific and religious views, the main research question is formulated as follows: In which aspects do religious and scientific viewpoints on the stages of embryonic development and the time of ensoulment overlap, and where do they differ?

To elaborate on the central research question, this study also addresses a set of secondary questions:

1. What are the philosophical and ethical aspects related to embryonic development from the perspectives of religion and science, and how can they be compared?

2. What are the jurisprudential views on the stages of embryonic development and the time of ensoulment, and how do these views align with scientific findings?

3. How can a more precise interpretation of Qur'anic verses about embryonic development, considering scientific findings and authentic prophetic narrations, contribute to a deeper understanding of this issue?

Research Method

This research employs a qualitative method and a descriptive–analytical approach. Accordingly, religious and scientific perspectives related to the stages of embryonic development are first described, and then, through comparative analysis, the points of convergence and divergence between these two viewpoints are identified and examined. The required data for this study are gathered from two main sources: first, specialized scientific resources in the fields of embryology, medicine, and philosophy, including books, scientific articles, theses, and reputable online databases and second, verses of the Holy Qur'an and related commentaries on embryonic development, which are analyzed by citing authoritative exegeses such as *Al-Mizan*, *Nemooneh*, and *Majma' al-Bayan*. Data analysis is based on comparing scientific and religious viewpoints whereby the overlaps and differences between these two approaches regarding the stages of embryonic development are extracted and interpreted.

Prenatal Developmental Stages from a Scientific Perspective

Early Stages of Embryonic Growth

1) Zygote Stage

The zygote stage, as the first stage of embryonic development, begins immediately after the fertilization of the sperm and egg in the fallopian tube and lasts approximately two weeks. This stage, marked by the formation of the zygote—a diploid cell containing 23 chromosome pairs from both parents— forms the foundation for all future cells of the embryo. Through successive mitotic divisions, the zygote divides into blastomeres and then forms a morula. On the fourth or fifth day, the blastocyst structure forms, comprising the inner cell mass (the future embryo) and the trophoblast (involved in placenta formation). The implantation of the blastocyst into the uterine wall, which typically occurs by the end of the first week, is essential for establishing pregnancy and creating a nutritional connection between the embryo and the mother. This critical stage determines the genetic characteristics of the embryo and is influenced by environmental factors such as nutrition, stress, and exposure to chemicals. Any disruption in

fertilization, cell division, or implantation may lead to early miscarriage or developmental anomalies (Britannica, Zygote; Veeck, 1992).

2) Blastula Stage

The blastula is a crucial phase in embryonic development following the zygote and morula stages, playing a fundamental role in cellular organization and the formation of early embryonic structures. In this stage, the cell mass transforms into a hollow structure consisting of a layer of cells (trophoblast) surrounding a fluid-filled cavity called the blastocoel. The blastocoel provides space for cell movement and organization. This stage is typically observed on the fourth to fifth days of embryonic development in mammals, including humans. The blastula forms from multiple cell divisions in the morula stage and consists of three main parts: the trophoblast (outer layer), which is responsible for protecting and nourishing the embryo and ultimately forms the placenta; the inner cell mass, which develops into the embryo and includes the epiblast and hypoblast; and the blastocoel, which contains fluid. The process of blastula formation involves cell divisions, fluid pumping, and initial cell differentiation, leading to the specialization of trophoblast and inner mass cells. This stage plays a key role in preparing the embryo for implantation into the uterine wall and initiating communication between the embryo and mother. Additionally, the blastula provides a basis for cell differentiation and the determination of body axes (e.g., anterior-posterior, left-right). The importance of this stage lies in its role in regulating growth, preparing for gastrulation, and the formation of the primary germ layers (ectoderm, mesoderm, and endoderm). Genetic disorders, adverse uterine conditions, or environmental factors such as alcohol and nicotine can disrupt this stage and negatively impact embryonic development (Britannica, Blastula).

Intermediate Growth Stages

1) Gastrulation Stage

Gastrulation is a critical stage in embryonic development that occurs after the blastula stage and involves the formation of the three primary germ layers (ectoderm, mesoderm, and endoderm). These layers form the basis for the differentiation of all body tissues and organs. During

gastrulation, complex cell movements occur, such as invagination, ingression, epiboly, convergent extension, and cell migration, leading to the determination of body axes, the initiation of cell differentiation, and the formation of early embryonic structures. The success of this process depends on genetic factors, uterine health, and environmental conditions, and a disruption can cause congenital anomalies or genetic syndromes. Gastrulation also prepares the embryo for subsequent stages of development, such as neurulation. A precise understanding of this stage is essential for ensuring normal embryonic growth (Britannica, Gastrula).

2) Neurulation Stage

Neurulation is a key phase following gastrulation, marking the beginning of nervous system formation and the development of the brain and spinal cord. In this stage, ectoderm cells respond to signals from the mesoderm and form structures such as the neural plate, neural groove, and ultimately the neural tube. This tube is the foundation of the central and peripheral nervous systems, with its anterior part becoming the brain and the posterior part the spinal cord. The success of this process depends on genetic factors, proper nutrition, and the uterine environment. Folate (Vitamin B9) plays a vital role in neural tube closure, and its deficiency can lead to disorders such as spina bifida or anencephaly. This stage is critical for the initial differentiation of the brain and the foundation of other body structures (Britannica, Neurula).

Advanced Growth Stages

After the completion of neurulation and the initial formation of the nervous system, the embryo enters subsequent stages of growth. These stages involve organ formation, cell differentiation, rapid growth, and the maturation of body structures. The key stages of embryonic growth after neurulation are outlined below:

1) Organogenesis Stage

Organogenesis is a critical stage of embryonic development during which the main organs and body systems form from the ectoderm, mesoderm, and endoderm germ layers. From the ectoderm, the skin, hair, nails, skin glands, and the nervous system, including the brain, spinal cord, and eyes, develop. The mesoderm gives rise to muscles,

bones, the heart, circulatory system, kidneys, and parts of the reproductive system, while the endoderm creates structures such as the digestive tract, lungs, liver, pancreas, and endocrine glands. This stage, occurring from the fourth to the eighth week of pregnancy, is vital for the initial development of organs and body systems, and a disruption can lead to congenital defects (Moore & Persaud, 2018, pp. 69-107).

2) Growth and Differentiation Stage

The growth and differentiation stage, from the ninth week of pregnancy until birth, is characterized by rapid fetal growth and the maturation of body structures. During this stage, cells divide rapidly and differentiate into specialized tissues and organs. The fetus becomes capable of movement, and its muscles and nervous system develop. In the second trimester (weeks 13-26), bone and muscle growth, fingerprint formation, and the development of motor coordination occur. In the third trimester (weeks 27-40), the fetus prepares for birth and life outside the womb through weight gain, fat storage, lung maturation, and brain development (Carlson, 2019, pp. 166-180).

3) Formation of Support Systems

Concurrent with fetal growth, support systems such as the placenta, amniotic sac, and umbilical cord develop to meet the fetus's vital needs. The placenta, as an interface between mother and fetus, enables the exchange of nutrients, oxygen, and the removal of waste, fully developing by weeks 12-13. The amniotic sac, by creating a fluid environment, protects the fetus from impact and temperature changes, while the umbilical cord, connecting the placenta to the fetus, transports nutrients and oxygen (Sadler, 2018, pp. 75-91).

4) Maturation of Organs and Systems

During the organ and system maturation stage, which primarily begins in the second trimester and continues until the end of the third trimester, the various body organs and systems that formed in earlier stages reach functional maturity. The central nervous system and brain continue to grow, forming new neural connections. The respiratory system prepares for independent breathing, particularly with the production of surfactant in the lungs from week 24. The cardiovascular system meets fetal needs by strengthening blood flow and heart function. Additionally, the digestive and urinary systems gradually

become more efficient, and the kidneys become capable of producing urine. This stage is accompanied by rapid fetal growth, weight gain increase, and the storage of subcutaneous fat for temperature regulation and energy after birth. The complete maturation of these systems prepares the fetus for independent life after delivery (Carlson, 2019, pp. 195-206).

5) Physical Growth and Preparation for Birth

In the third trimester of pregnancy, the fetus undergoes the final stages of physical growth and organ maturation in preparation for life outside the womb. During this period, a significant increase in fetal weight and height is observed, along with the storage of subcutaneous fat for postnatal temperature regulation. The lungs mature sufficiently for independent breathing with the production of surfactant, and the digestive, cardiovascular, and nervous systems reach full development. Simultaneously, the growth of the nervous system and the formation of more neural connections continue, along with the strengthening of movements and muscle coordination. In the final weeks, the fetus typically assumes a head-down position in preparation for delivery. This stage ensures the fetus's complete readiness for independent life outside the uterus (Moore & Persaud, 2018, pp. 355, 363).

Comparison of Prenatal Developmental Stages with Religious Teachings

Analysis of Qur'anic Verses Related to Embryonic Stages

The Qur'anic depiction of embryogenesis, though articulated in pre-scientific language accessible to its first audience, astonishingly parallels modern embryological findings. This congruence reveals not merely a coincidence but rather the Qur'an's divine origin and its timeless capacity to guide human understanding through both revelation and reason.

1) Verses Related to Human Creation from a Sperm-Drop

The Holy Qur'an, in numerous verses, refers to the creation of humans from a *Nutfah* (sperm-drop), highlighting this stage as one of the important and wondrous phases of creation. Lexically, "*Nutfah*" is defined as pure, extracted water (Ibn Manzur, 1985, Vol. 9, p. 335; Firoozabadi, 2005, Vol. 3, p. 200), and in scientific terminology, it refers

to the male (spermatozoon) and female (ovum) reproductive materials that play a role in fertilization and embryo formation (Zahedi, 2018, p. 189). Verses such as those in *Surah Al-Mu'minun* (23:12-14), *Al-Hajj* (22:5), *Ghafir* (40:67), and *Al-Qiyamah* (75:37-39) describe the stages of embryonic development from *Nutfah* to *Alaqah*, *Mudghah*, bone formation (*Idhaam*), and the full formation of the body. The Qur'an emphasizes the contribution of both sexes in procreation and the growth of the embryo in the uterine environment (Al-Mu'minun, 23:13). Commentaries also consider *Nutfah* to include sperm, ovum, and the fertilized egg, highlighting their vital role in human formation (Makarem Shirazi, 1995, Vol. 2, p. 136; Rezaei Esfahani, 2008, Vol. 3, p. 107; Tabarsi, 1988, Vol. 7, p. 113). These descriptions demonstrate the precision and grandeur of the divine process of creation.

2) Verses Related to *Alaqah* and *Mudghah*

In the Holy Qur'an, the stages of human creation are described with scientific and spiritual precision. Following the *Nutfah* stage, two key stages, "*Alaqah*" and "*Mudghah*," are mentioned, each representing a fundamental step in embryonic development. The word "*Alaqah*," meaning a clinging clot or leech-like substance, describes the stage where the embryo attaches to the uterine wall and nourishes from the mother's blood. This concept is mentioned in verses such as *Surah Al-Mu'minun* (23:14), *Al-Hajj* (22:5), *Ghafir* (40:67), and *Al-Alaq* (96:2). The comparison of *Alaqah* to a leech is due to similarities in shape and feeding behavior (Taleghani, 1983, Vol. 6, p. 178; Makarem Shirazi, 1995, Vol. 27, p. 156). The subsequent stage, "*Mudghah*," meaning a chewed lump of flesh, indicates the beginning of structural differentiation in the embryo. The Qur'an, in verses like *Surah Al-Mu'minun* (23:14) and *Al-Hajj* (22:5), refers to two states of *Mudghah*: *Mudghah Mukhallaqah* (formed) and *Ghayr Mukhallaqah* (unformed), indicating flexibility and precision in the creative process. These Qur'anic descriptions show significant correspondence with scientific findings, demonstrating the divine majesty in the design and guidance of human creation (Tabatabai, 2014, Vol. 14, p. 344; Rezaei Esfahani, 2008, Vol. 13, p. 253).

Interpreters' Views on Embryonic Growth Stages

The views of Qur'an interpreters regarding the stages of embryonic growth reflect the depth of their knowledge and the diversity of their exegetical approaches. Authoritative commentaries such as *Al-Mizan*, *Nemooneh*, *Jami' al-Bayan* by al-Tabari, *Mafatih al-Ghayb* by Fakhr al-Razi, and *Majma' al-Bayan* by al-Tabarsi have examined the stages of human creation using philosophical, mystical, narrative, historical, and literary approaches. In *Al-Mizan*, Allamah Tabatabai, with a philosophical and mystical perspective, describes the seven stages of human creation as including dust, *Nutfah*, *Alaqah*, *Mudghah*, bone formation, clothing bones with flesh, and the breathing of the spirit (Tabatabai, 2014, Vol. 15, p. 24). The *Nemooneh* commentary, emphasizing the role of both male and female in procreation, correlates the stages of embryonic growth with biological concepts and considers the stage of "*Insha'a*" (creation) as the beginning of human life (Makarem Shirazi, Vol. 14, p. 207; Ibid., Vol. 2, p. 140). Al-Tabari in *Jami' al-Bayan* and al-Tabarsi in *Majma' al-Bayan*, by comparing *Mudghah* to chewed meat, refer to the difference between formed and unformed *Mudghah* (al-Tabari, 2001, Vol. 16, p. 460; Tabarsi, 1988, Vol. 7, p. 114). Fakhr al-Razi, in *Mafatih al-Ghayb*, presents the stages of embryonic growth as evidence for the existence of God and His infinite power, linking them with philosophical and biological concepts (Fakhr al-Razi, 1999, Vol. 3, pp. 203-204). These commentaries, despite differences in approach, all emphasize the complexity and wonder of the stages of human creation.

The Concept of Ensoulment in the Embryo

The issue of ensoulment in the embryo is an important and complex topic in Qur'anic exegesis, encompassing significant scientific, ethical, and philosophical dimensions. Lexically, the word "*Nafkh*" means "to blow," and in exegetical terminology, it refers to the entry of the soul into the human body (Raghib Isfahani, 1992, p. 816). The soul is an abstract, immaterial substance that bestows upon humans characteristics such as life, intellect, and will, as indicated in numerous Qur'anic verses.

The discussion regarding the precise timing of ensoulment is a subject of disagreement among Qur'an commentators and religious scholars. The Qur'an does not explicitly specify a time for this process, and empirical sciences, due to the unobservable and intangible nature of this phenomenon, are unable to provide a definitive answer. Various viewpoints have been expressed by scholars and jurists in this regard:

1. Four Months: Some jurists, citing Islamic narrations, state that ensoulment occurs at four months of gestation (Najafi, 1983, Vol. 5, p. 345).

2. 120 Days: Another group specifies this time precisely on the 120th day after the formation of the *Nutfah* (Afshar & Mahmoudian, 2012, p. 81).

3. Upon Complete Entrance (*Wuluj*): Some scholars believe that ensoulment coincides with the complete entrance or settling of the soul into the body (Ansari, n.d., Vol. 2, p. 318).

4. After Completion of Physical Growth Stages: This view holds that ensoulment occurs after the completion of the embryonic growth stages, including *Nutfah*, *Alaqah*, *Mudghah*, bone formation, and clothing the bones with flesh (al-Tabari, 2001, Vol. 17, p. 21). These disagreements indicate the complexity and ambiguities surrounding this topic, necessitating further investigation from religious and scientific perspectives.

Comparison of Islamic, Other Religious, and Scientific Views on Ensoulment

The concept of ensoulment and its timing has long been a subject of debate among scholars of various religions. As discussed, Islam presents various views on the timing of ensoulment. In Christianity, the Catholic doctrine holds that ensoulment occurs at the moment of conception, and the embryo is considered a full human being from the very beginning. This view is based on the theological foundations of this denomination and specific interpretations of the Bible. Other Christian branches, such as Orthodox and Protestant, hold different views on the time of ensoulment, dependent on varying interpretations of sacred texts. In Judaism, according to the Talmud, ensoulment occurs at the moment of fertilization, leading to special respect for fetal life. In Buddhism, it is believed that the fetus possesses personhood after conception and is worthy of respect, and abortion is considered a grave

sin. Most Hindus believe that human personality begins with reincarnation at the moment of conception, and the early embryo is regarded as a respectable being (Sarikhaniet al., 2020, pp. 134-135). Discrepancies in views on ensoulment stem from differences in interpreting religious texts, philosophical foundations, and the scientific empirical approach to metaphysics. In Islam, the lack of explicit mention of the precise time of ensoulment in the Qur'an and differing interpretations of narrations have led to divergent views among jurists and commentators (Najafi, 1983, Vol. 5, p. 345; Tabarsi, 1988, Vol. 7, p. 114; al-Tabari, 2001, Vol. 16, p. 460; Tabatabai, 2014, Vol. 15, p. 24). In Christianity as well, different interpretations of the Bible and varying theological bases have resulted in diverse views on the time of ensoulment (The Bible, 1 Corinthians 12:13; Thiessen, n.d., p. 159). Empirical science, furthermore, generally does not employ the concept of the soul as an independent entity, as it lacks the tools to observe and measure it. In this approach, phenomena like life and consciousness are usually attributed to biological and neurological activities. For instance, consciousness is attributed to brain activity, the nervous system, and electrical activities in nerve cells, without mention of the soul (National Academy of Sciences, 1999, pp. 1-2).

Comparative Analysis with Scientific Findings

Overlaps

A comparative examination of the stages of embryonic formation from the perspectives of the Qur'an and embryology reveals significant overlaps, indicating the scientific miracle of the Qur'an and the accuracy of its content in the field of empirical sciences. These overlaps are as follows:

1. Nutfah Stage: The Qur'an refers to the initial stage of human creation with the word "*Nutfah*" (Surah 'Abasa 80:19; Al-Insan 76:2; Al-Nahl 16:4; Al-Najm 53:46, and other verses). In embryology, the fertilized egg cell, called a "zygote," is the starting point of embryonic formation. Both sources refer to this initial fluid in which genetic information is embedded and which holds the potential to become a complete human being (Britannica, Zygote; Veeck, 1992).

2. Alaqah Stage: In the Qur'an, the next stage is called "*Alaqah*," meaning a clinging substance (Surah Al-Qiyamah 75:38; Ghafir 40:67; Al-Hajj 22:5). In embryology, the blastocyst (the embryo around day five post-fertilization) implants into the uterine wall. The appearance of the blastocyst also resembles a leech that clings to blood. Another similarity in this stage is the secretion of heparin by both the embryo and the leech, which prevents blood coagulation (Britannica, Zygote; Veeck, 1992).

3. Mudghah Stage: In the Qur'an, the third stage is called "*Mudghah*," meaning something resembling chewed flesh (Al-Hajj 22:5). In embryology, in the fourth week after fertilization, the embryo's shape gradually changes and resembles a chewed lump of flesh. Different parts of the body also begin to take shape in this stage. A visual similarity between the Qur'anic description and the embryo's form in embryology is evident (Sadler, 2018, p. 38; Rezaei Esfahani, 2001, Vol. 2, p. 498).

4. Bone Formation Stage: The Qur'an refers to the separate formation of bones (Al-Mu'minun 23:14). In embryology, in the sixth week of embryonic growth, the cartilaginous skeleton forms and is later replaced by bone. The sequence mentioned in the Qur'an corresponds with the scientific stages (Carlson, 2019, pp. 166-180).

5. Clothing Bones with Flesh Stage: The Qur'an mentions the clothing of bones with flesh (Al-Mu'minun 23:14). In embryology, after bone formation, muscle cells begin to grow and cover the bones (Carlson, 2019, pp. 166-180).

6. Ensoulment: The Qur'an refers to the breathing of the spirit into the embryo at a stage of its creation. Although the precise time is not specified in the Qur'an, the verses point to the physical completion of the embryo before ensoulment (Al-Mu'minun 23:14; Al-Hijr 15:29; Sad 38:72; Al-Sajdah 32:9). Science does not determine the exact time of ensoulment and fundamentally does not enter the discussion of the soul as a metaphysical subject. However, studies on the beginning of life and fetal brain activity continue (National Academy of Sciences, 1999, pp. 1-2).

7. Birth Stage: The Qur'an describes the process of birth and the baby's exit from the mother's womb (Surah 'Abasa 80:19-20; Ghafir 40:67). Embryology provides a detailed description of the stages of labor and the mechanism of delivery (Moore & Persaud, 2018, pp. 355, 363). The correspondence between the stages of embryonic creation from the Qur'anic perspective and embryology demonstrates the accuracy of the Qur'an's content in this field. Given the ongoing advancements in science, it is likely that further overlaps between Qur'anic descriptions and scientific findings will be discovered in the future.

Differences and Diverse Interpretations

In the comparative study of embryonic stages from the perspectives of the Qur'an and empirical science, alongside the existing overlaps, differences are also observed in details and interpretations, stemming from the distinct objectives and approaches of these two fields of knowledge. These differences are as follows:

1. Number of Stages: The Qur'an expresses four main stages (*Nutfah*, *Alaqah*, *Mudghah*, and bone formation/clothing with flesh) for embryonic growth in the mother's womb (Al-Mu'minun 23:14). Embryology provides more complex classifications with more stages and finer details of embryonic growth (Moore & Persaud, 2018, pp. 355, 363).

2. Detail of Descriptions: In the Qur'an, descriptions are general and comprehensible to the general public, emphasizing the apparent and observable aspects of the embryo at each stage (Al-Mu'minun 23:14). Embryology, using scientific and specialized language, provides precise details of the structure, function, and cellular and molecular changes at each stage of embryonic growth (Carlson, 2019; Sadler, 2018, p. 38; Veeck, 1992).

3. Precise Time of Ensoulment: The Qur'an does not specify the precise time of ensoulment, and various interpretations of the Qur'anic verses on this matter exist (Al-Mu'minun 23:14; Al-Hijr 15:29; Sad 38:72; Al-Sajdah 32:9). Embryology also does not have a definitive answer for the time of ensoulment, as this topic falls outside the scope of empirical studies (National Academy of Sciences, 1999, pp. 1-2).

4. Origin of the Initial Fluid: In some Qur'anic verses, the origin of the initial fluid of human creation is mentioned as "*Ma' Dafiq*" (gushing water), which can have various interpretations. Some commentators interpret it as male semen (Tabatabai, 2014, Vol. 20, p. 260; Makarem Shirazi, Vol. 26, p. 367), while others interpret it as a combined fluid from the male and female (Tabarsi, 1988, Vol. 10, pp. 713, 715). Embryology identifies fertilization between sperm (male gamete) and ovum (female gamete) as the origin of the zygote and the beginning of embryonic growth (Britannica, Zygote; Veeck, 1992).

5. Role of Male and Female in Procreation: In some Qur'anic verses, more emphasis is placed on the role of the male "*Ma*" (fluid) in the creation of the embryo (Al-Tariq 86:6). Embryology confirms the equal contribution of the male and female in providing genetic information and forming the embryo (Britannica, Zygote; Veeck, 1992).

6. Purpose of Describing Embryonic Stages in the Qur'an: The Qur'an's purpose is not to provide scientific details of embryonic growth but to emphasize God's power in human creation and to guide humans to reflect and ponder upon the stages of life's formation (Tabatabai, 2014, Vol. 14, p. 344; Rezaei Esfahani, 2008, Vol. 13, p. 253). In contrast, the purpose of embryology is a scientific and detailed understanding of how the embryo grows and the biological mechanisms governing this process.

Therefore, the differences and diverse interpretations regarding embryonic stages from the perspectives of the Qur'an and empirical science are due to the distinct objectives and approaches of these two fields of knowledge. While the Qur'an, in simple language understandable to the general public, emphasizes the miracle of creation and God's power, embryology, in specialized language and with detail, investigates biological mechanisms. In other words, the Qur'an addresses the "why" of creation, and science addresses the "how." These two perspectives complement each other and provide a comprehensive understanding of the phenomenon of human creation.

Jurisprudential and Legal Dimensions of Prenatal Development

Rights and Value of the Embryo from a Religious Perspective

The legal and jurisprudential dimensions of fetal rights and the value of its life from the perspective of Islam and the Qur'an are subjects of great importance. Islam attributes high value to human life, beginning from the moment the *Nutfah* is formed. The Holy Qur'an (Al-An'am 6:151) and Islamic narrations (Kulayni, 2009, Vol. 13, p. 679; Hurr al-'Amili, n.d., Vol. 26, pp. 31-32) explicitly emphasize the right to life of the embryo and the prohibition of its abortion.

Legal Dimensions of the Embryo in Islam

The legal dimensions of the embryo in Islam include several aspects. From the moment the *Nutfah* is formed, the embryo is entitled to life, and its abortion is not permissible except in exceptional cases and under specific conditions (Khomeini, 2013, Vol. 23, p. 514). Furthermore, from the beginning of its formation, the embryo is regarded as possessing human dignity and deserving respect and should not be considered a worthless entity (Mashayekhi, 2019, p. 136). It has the right to be protected from any harm or danger threatening its health and life, and parents are obliged to care for it and provide the grounds for its growth and development (Ansari, 2013, Vol. 1, p. 194).

Jurisprudential rulings related to the embryo are also significant. In Islamic jurisprudence, blood money (*Diyah*) is prescribed for abortion, the amount of which varies according to the stage of embryonic development (Najafi, 1983, Vol. 43, pp. 356-366). This indicates the importance and high value of the embryo in the Islamic legal system. Abortion is forbidden (*Haram*) in Islam, except in specific emergency cases in which the mother's life is at risk (Khomeini, 2013, Vol. 39, p. 428). In such cases, specific conditions and limitations, including the definitive diagnosis by three specialist physicians and the approval from the Legal Medicine Organization, are required for a therapeutic abortion permit (Single Article of the Therapeutic Abortion Law, 2005). Additionally, if born alive, the embryo inherits from its parents (Najafi, 1983, Vol. 39, pp. 70-73).

Regarding inferring the time of ensoulment from narrations and its effects, some jurists, based on verses and narrations, consider the time of ensoulment to be after the completion of the embryo's skeleton. Accordingly, full blood money is due for the embryo after ensoulment, and most jurists consider abortion after this stage forbidden (Najafi, 1983, Vol. 43, pp. 356-366).

The Qur'anic foundations for the value of embryonic life are evident in numerous verses of the Holy Qur'an that refer to the stages of embryonic growth and the manner of human creation, indicating the importance and value of human life from God's perspective (Al-Qiyamah 75:38; Ghafir 40:67; Al-Hajj 22:5). The Qur'an invites humans to reflect upon their own creation and the divine majesty and power (Ghafir 40:57; Qaf 50:15). Therefore, human life from the moment the *Nutfah* is formed is sacred and possesses intrinsic value, and abortion, except in exceptional cases and in compliance with Shari'ah and legal regulations, is not permissible (Najafi, 1983, Vol. 43, pp. 356-366; Khomeini, 2013, Vol. 39, p. 428). By providing precise jurisprudential rules and emphasizing fetal rights, Islam has placed the responsibility of caring for and preserving this valuable life upon parents and society (Ansari, 2013, Vol. 1, p. 194). This approach demonstrates the comprehensiveness and precision of Islamic Shari'ah in protecting human rights at all stages of life, even before birth.

The Scientific Perspective on Embryonic Life

The value of embryonic life and its associated rights, from scientific and empirical perspectives, is a complex and multifaceted subject discussed at the intersection of embryology, bioethics, and medical law (Veeck, 1994; Larijani, 2008). While religious viewpoints attribute intrinsic value and the right to life to the embryo from the moment of conception, scientific approaches propose different criteria for determining the beginning of life and the personhood of the embryo.

Among the scientific approaches to the value of embryonic life is the criterion of brain development and neural activity. This perspective links the beginning of human life and the recognition of individual identity to sufficient brain development and the onset of brain wave activity. This

approach often contrasts with the concept of ensoulment in religious views, considering the value of the embryo dependent on a specific stage of nervous system development (Al-Bouyeh & Goudarzi, 2017, p. 65).

Another criterion is independent viability. This view conditions the right to life on the embryo's ability to sustain life independently of the mother's body. Accordingly, the value of the embryo in the early stages of development is considered lesser, and abortion in these stages is viewed more permissively (Al-Bouyeh & Goudarzi, 2017, p. 65).

The legal dimensions of the embryo from scientific and bioethical perspectives are also noteworthy. Many legal systems recognize the embryo's right to life, but usually consider circumstances such as a threat to the mother's life or the presence of serious fetal abnormalities as permissible grounds for abortion, which can be termed as conditional right to life (Moeinifar, 2019). Furthermore, Protective laws regulating exposure to harmful agents during various stages of pregnancy are among the recognized rights of the embryo from scientific and legal perspectives, referred to as the right to protection. Additionally, parents have the right to receive sufficient information from specialists regarding the stages of embryonic development, potential risks, and methods of prenatal care, which can be considered the parental right to information and awareness.

Finally, ethical considerations regarding the embryo are also significant. Finding a balance between the mother's right to autonomy and the embryo's right to life is a fundamental ethical challenge in this field. The use of embryos or embryonic stem cells in scientific research faces serious ethical limitations and requires careful ethical and legal scrutiny. Moreover, maintaining proper nutrition, avoiding harmful substances, and undergoing screening tests and prenatal care are among the ethical responsibilities of parents toward the health of the embryo (Haji Dehabadi, 2021, pp. 85-86).

Philosophical Dimensions of Prenatal Development

Philosophical discussions regarding the stages of embryonic growth and the time of life's commencement have long attracted the attention of scholars, leading to diverse viewpoints rooted in various philosophical foundations.

Stages of Embryonic Growth from the Perspective of Islamic Philosophy

The discussion of the soul and body is a fundamental issue in Islamic philosophy. Muslim philosophers such as Avicenna (Ibn Sina) and Mulla Sadra emphasized the theory of the duality of soul and body, considering humans as beings composed of these two. The soul is an immaterial substance and the source of life and consciousness, while the body is the material aspect and an instrument for the manifestation of the soul in the material world.

Avicenna believed that the soul initially exists potentially in the embryo and, with the body's development and readiness, becomes actualized and incarnates within it (Ibn Sina, 1984, p. 187; Ibn Sina, 2000, p. 456). He considered the heart the first organ formed in the embryo and linked the attachment of the soul to this organ (Ibn Sina, 2000, p. 391). Mulla Sadra, complementing Avicenna's theory, advocated the doctrine of corporeal origination and spiritual subsistence of the soul (Mulla Sadra Shirazi, 1981, p. 95) and divided the stages of the soul's development in the embryo into three stages: the vegetative soul (responsible for growth and nutrition), the animal soul (responsible for senses and movement), and the rational soul (responsible for thought and perception). He believed the embryo initially possesses the vegetative soul and with the body's development and meeting the necessary conditions, it transforms into the animal soul and then into the rational soul (Mulla Sadra Shirazi, 1981, Vol. 8, p. 144). Muslim philosophers do not have a unanimous view on the precise time of the beginning of human life and have presented different opinions based on their philosophical principles. Some consider the beginning of human life simultaneous with conception, believing that the *Nutfah* potentially contains all human faculties (Amini, 2015, p. 63; Abbasi, 2000, p. 235). Others attribute the beginning of human life to the time of the soul's attachment to the body and propose various criteria such as heart formation, brain development, and the onset of voluntary fetal movement to determine the time of this attachment (Amini, 2015, p. 76; Abbasi, 2000, p. 235).

The Time of Ensoulment and Related Views

Most researchers, considering Qur'anic verses and narrations, believe the time of ensoulment in the embryo is after the completion of the skeleton and the growth of flesh upon it, approximately at four months (Abbasi, 2000, p. 235). Others have pointed to signs such as voluntary fetal movement in the womb, activation of some senses, and heartbeat to determine the time of ensoulment, considering ensoulment in the embryo as the beginning of human life in the complete sense and the origin of personhood and individual identity (Amini, 2015, p. 76). In this regard, several views have been proposed:

Avicenna's View: Avicenna believed that the soul incarnates gradually in the embryo with the body's development. He considered heart formation a turning point in this process (Ibn Sina, 2000, p. 391) and accordingly, ensoulment occurs after heart formation and the beginning of its activity (Ibn Sina, 1984, p. 95).

Mulla Sadra's View: Mulla Sadra divided the stages of the soul's development in the embryo into the vegetative soul (responsible for growth and nutrition), the animal soul (responsible for senses and movement), and the rational soul (responsible for thought and perception). He believed that the embryo first possesses the vegetative soul and with the body's development and meeting the necessary conditions, reaches the animal soul and then the rational soul stage sequentially (Mulla Sadra Shirazi, 1981, Vol. 8, p. 144).

View Based on Fetal Movement: Some philosophers and theologians consider voluntary fetal movement in the womb, a sign of ensoulment and the beginning of human life. They believe that before ensoulment, fetal movements are involuntary and unconscious, and with the breathing of the spirit, the embryo becomes capable of voluntary and purposeful movements (Abbasi, 2000, p. 235).

View Based on Complete Embryonic Formation: Another group links ensoulment to the time of the complete formation of the embryo's organs and limbs. They believe that as long as the embryo's body is not fully formed, it lacks the necessary readiness to accept the soul, and ensoulment occurs after the completion of the embryo's physical structure (Amini, 2015, p. 76).

Discussion and Conclusion

This research conducted a comparative study of the stages of embryonic development from the perspectives of science and religion, with emphasis on the Holy Qur'an, Islamic philosophy, and modern scientific findings. Analyzing the stages of prenatal development not only provides a deeper understanding of human creation but also demonstrates that the Holy Qur'an has remarkably and accurately referred to the stages of embryonic growth. Qur'anic concepts such as "*Nutfah*" (sperm-drop), "*Alaqah*" (clinging clot), "*Mudghah*" (chewed lump), "*Idhaam*" (bones), and "*Lahm*" (flesh) show significant correspondence with contemporary scientific findings. This harmony testifies to the profound connection between empirical sciences and revelatory teachings. The Holy Qur'an, in simple and comprehensible language, describes the process of human creation and emphasizes the role of divine power in this process, while embryology, with a specialized and detailed approach, provides a precise analysis of the embryo's structure and function at each stage. Although significant overlaps are observed between these two domains, differences also exist in the number of stages, descriptive details, the time of ensoulment, and the origin of life. Therefore, it may be concluded that the Qur'an and science, though differing in approach, complement one another in providing a more comprehensive understanding of the process of human creation. The Qur'an, with a holistic view based on divine wisdom, and science, with empirical and analytical methods, each contribute to a deeper understanding of this complex phenomenon. This convergence between religion and science not only enriches human understanding of human creation but also provides a ground for constructive dialogue between these two fields.

From a philosophical perspective, the interpretation of these stages emphasizes the status of the soul and its relationship with the body. Avicenna and Mulla Sadra, each with different viewpoints, pointed to the attachment of the soul to the body after its development. Avicenna considers the origination of the soul as spiritual, while Mulla Sadra believes its origination is corporeal and its subsistence spiritual. The Holy Qur'an describes this process with greater precision and detail.

One of the most contentious issues is "ensoulment," which, due to its metaphysical nature, lies outside the scope of empirical scientific investigation. While Islamic philosophy and religious teachings address this topic, science is unable to provide a definitive answer in this regard. From the Islamic perspective, the embryo possesses high value from the moment of conception, and abortion is considered a reprehensible and forbidden act. This view aligns with scientific findings that emphasize the unique genetic identity of the embryo from the time of fertilization.

This research complements previous findings on the harmony between the stages of embryonic growth in the Qur'an and science and, by examining more details, expands the correspondences into philosophical dimensions as well. Furthermore, it pays special attention to issues related to ensoulment and its ethical, legal, and jurisprudential implications. Studies such as Kamkar et al. (2010) and Kashefi (2006) have also addressed the correspondence of Qur'anic concepts with scientific stages of embryonic growth, but this study has taken a step further by providing a more comprehensive analysis. Scientifically, the precise analysis of embryonic growth stages in the Qur'an can inspire new research in embryology and medical sciences. Ethically and legally, this research emphasizes the importance of preserving the human dignity of the embryo and observing its rights from the moment of conception, and it can be used in policies related to abortion and bioethics. Philosophically, understanding the relationship between soul and body can contribute to rethinking issues related to anthropology and the meaning of life.

This research possesses strengths such as the use of authoritative Qur'anic, exegetical, and scientific sources and the presentation of a comprehensive and comparative perspective on the subject. However, there are also limitations, including lack of access to all ancient and modern exegetical sources, the impossibility of deeply examining all scientific viewpoints due to the vastness of the subject, and limitations in precisely linking scientific data with philosophical teachings due to differences in the language and methodology of these two fields. The results of this research show that the Holy Qur'an addresses the stages of embryonic growth in simple, understandable, yet precise language.

These findings are consistent with modern scientific concepts and in some cases indicate even greater precision and attention to detail. Philosophical views also show relative consistency with the Qur'anic approach but require further reflection and research.

Finally, suggestions for future studies are offered: a more comprehensive comparative study between modern scientific views and Qur'anic teachings; a deeper study of philosophical concepts related to the stages of embryonic growth; and research on the ethical and legal impacts of Qur'anic teachings on medical and biological policies. This research endeavored to provide a better understanding of the harmony between Qur'anic teachings, empirical sciences, and philosophical concepts through comprehensive and comparative analysis, and it is hoped that these findings can be utilized in future research and applications.

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