Editorial - Educational

Immortality: Is it Possible?

Jaffar M. Albareeq, DLO, RCP, RCS*

I did my postgraduate training in the 70's at St. Mary's Hospital Medical School in London and I rotated in different subspecialties of Otolaryngology (head and neck with Mr. Walsh Waring and in otology with Mr. Robins and Mr. John Wright). In immunology and allergy, I was trained by Dr. William Frankland[1,2].

The Queen of Britain has sent two cards to Dr. William Frankland for reaching 105 years, such grand age. It is customary that the queen sends congratulations to all those who passed 100 years, but this tradition would stop as soon as many more people would be passing that age, it is expected to be achieved in most developing countries.

Dr. Frankland is Britain's oldest working doctor who still contributes to journals and offers consultations in allergies[1,2]. Dr. Frankland was a colleague of Sir Alexander Fleming, who discovered the enzyme lysozyme in 1923 and benzylpenicillin (Penicillin G) from the mold Penicillium notatum in 1928, for which he was awarded the Nobel Prize in 1945. He discovered benzylpenicillin (Penicillin G) at St. Mary's Hospital laboratory, which was then named after him as the "Fleming Wing"[3].

Dr. Frankland was the first physician to associate allergy with a malfunctioning immune system. Therefore, he confirmed the premise of injecting a small amount of the offending allergen to retrain the errant immune system. Dr. Frankland is still functioning as a non-paid consultant at Guy's Hospital, where he researched peanut allergies. He received his MBE at age 103 in 2015. Dr. Frankland faced death but for some reason or another, managed to escape. He was a prisoner of war at Changi POW camp after the British surrendered to Japan in the Battle of Singapore during World War II[1,2].

Long life or eternal life was a dream. The Epic of Gilgamesh is a poem from ancient Mesopotamia, regarded as the earliest work of literature (circa 2100 BC). King Gilgamesh was extremely sad about the death of his partner Enkidu and watched him for three days until he saw a worm come out of his nose. Gilgamesh decided to undertake a long and dangerous search to discover the secret of eternal life. He eventually learned that "Life, which you look for you will never find. For when the gods created man, they let death be his share"[4].

In the pre-antibiotic era, people died from a minor injury due to infection. King Richard, the Lionheart of the Middle Ages, was famous for leading the Third Crusade where he fought against Saladin, the Muslim leader, for six years. The nickname 'Lionheart' is a tribute to his great courage and honorable behavior as a soldier. While he was besieging a castle in the quest for treasure in France, he was struck in the shoulder by an arrow, and in a few days he died; though it is by our definition now considered a minor injury, because of unavailability of antibiotics back then, it was a killer[5].

Before the discovery of penicillin by Dr. Flemming in St. Mary's hospital, it was not unusual to see heaps of sawn-off limbs adjacent to the battlefield. The medical corps in those days composed of doctors, carpenters and butchers because they knew the way of cutting and severing limbs. Amputation was the golden solution for most limb injuries before the discovery of antibiotics. Medical items available to medical corps were limited and their efficacy was restricted.

Aging is a treatable condition and very soon, we will have the technology to treat it. Scientist and a biochemist Cynthia Kenyon found a simple genetic mutation that can double the life of a simple worm. Soon, the gene for aging in humans will be discovered; at that stage, through genetic manipulation, scientists would be able to stop aging process or retard it[6].

In the past, a quarter and a third of children did not reach adulthood. In the seventeenth century, few people lived up to the sixth decade; their lives were short according to today's definition. If anyone told them that they could live up to 100, they would have thought it was a joke.

What is the limit of human life?

Emma Morano, an Italian woman, passed at the age of 117 years. Jeanne Calment of France lived to be 122 years old. Analysis of the lifespan of the elderly individuals from the USA, UK, France, and Japan since 1968 revealed no evidence of a limit of lifespan, and if a maximum exists, it has yet to be identified[7].

* Chief Editor, Bahrain Medical Bulletin
Director of Research and Ethics
King Hamad University Hospital
The Kingdom of Bahrain
E-mail: jaffar.albareeq@khuh.org.bh; jmab@batelco.com.bh

The average lifespan in Bahrain keeps changing. The change in lifespan is not incidental; it has been observed in many developed countries. It is mainly due to improved health services, housing, sanitation, nutrition and education resulting in a steady decline in early and mid-life mortality. Bahrain witnessed an explosion in economic development after the oil price rise in 1973. In 1920, the average Bahraini newborn could expect to live for 25-40 years due to many reasons: sickle cell disease, Thalassemia, heat, malaria, acute infectious and tropical diseases. A Bahraini born in 1980 could expect 76 years, and today, life expectancy has jumped to 80 years.

In the past, people in Bahrain who lived beyond the age of 50 years were labeled as those who "live on the interest", that is on their years of saving.

Internationally, reductions in infant and child mortality resulted in a substantial increase in life expectancy. It is mainly due to the reduction in mortality from infectious diseases. In high-income countries, such as Bahrain, mortality from non-communicable diseases has decreased. In the past three decades, life expectancy after the age 60 years has improved. Studies revealed that in high-income countries, the risk of dying between ages 60 and 80 years has been decreasing at a rate of 1.5% a year[8].

In 1883, scientists discovered the immortal jellyfish (Turritopsis nutricula) in the Mediterranean Sea. However, its unique regeneration powers were not revealed to science until the mid-1990s.

The mature immortal jellyfish, if injured or starved, will turn into a living blob and attach itself to a surface. The blob, when the environment is suitable, will undergo "transdifferentiation". Cells will differentiate into different kinds of cells, nerve, muscle, egg, sperm, etc. Its transformation process is unmatched in the animal kingdom.

People die due to heart attack, cancer, and infection; these diseases have remedies and one day will be eliminated[9].

In the future, nano-robots will be developed and inserted into the human body, which would be able to open blocked blood vessels, protect the body against viruses and bacteria, eliminate cancer cells and reverse aging processes. That technology might be achieved by 2050 or 2100; therefore, some humans will become immortal, unless faced with a fatal accident or trauma.

Immortality is a dream of the rich, the powerful, the beautiful and the dictators. I still remember the film of the old princess who drank the blood of beautiful young girls to restore her beauty and youthfulness and not to forget Prince Dracula, who sustained himself by drinking blood; those who created these fantasies did not know that blood contains stem cells. Death is a fearful event even for those who are extremely religious and believe in the reward of heaven, possibly of their doubts; only a few do not dread death or eternal life. It is possible that humans will eventually overcome all obstacles and turn dreams, such as space invasion, genetics and stem cell therapy and many others into reality. It is up to you, the newly trained medical graduates, to make eternal life a reality through research and innovation.

Scientists at Albert Einstein College of Medicine have found that stem cells in the hypothalamus govern the aging process. The research was performed on mice, which has far-reaching repercussions for warding off age-related diseases and extending lifespan[10]. The number of neural stem cell in hypothalamus declines with aging. That process is reversible through replenishing the stem cells or the molecules they produce, microRNAs (miRNAs)[10]. An extract of miRNA-containing exosomes from the stem cells in the hypothalamus was prepared and injected into the CSF of middle-aged mice; this slowed the aging process, as revealed by tissue analysis, behavioral testing, muscle endurance, coordination, social behavior and cognitive ability.

Research is to explain the mysteries and explain the unexplainable. Research in health is to improve healthcare delivery through defeating acute diseases and chronic non-communicable diseases. The establishment of the National Institute for Health Research Cancer Research Network (NCRN) led to an increase in clinical research National Health Service. A study revealed that survival of colorectal cancer patients has improved due to their participation in interventional clinical studies. The study was published in Gut 2017[11]. This is what "research improves the healthcare delivery" means.

In the future, immortality would not be a dream but a reality, and I hope our researchers in the Arab World and Bahrain, especially in King Hamad University Hospital would not lag behind their peers around the world.

Finally, I would say that eternal life or extended life is not a far reaching dream; but would it be affordable to all, or would it be limited to only the rich and powerful or dictators.

Potential Conflicts of Interest: None.

Competing Interest: None.

Sponsorship: None.

REFERENCES

1. William Frankland (immunologist). https://en.wikipedia.org/wiki/William_Frankland_(immunologist) Accessed in September 2017.
2. 105-Year-Old Doctor Still Working after Surviving Second World War. http://www.independent.co.uk/news/uk/home-news/105-year-old-doctor-william-frankland-pow-camp-second-world-war-saddam-hussein-treat-a7660611.html Accessed in September 2017.
3. Sir Alexander Fleming - Biographical. https://www.nobelprize.org/nobel_prizes/medicine/laureates/1945/fleming-bio.html Accessed in September 2017.
4. The Epic of Gilgamesh. http://www.aina.org/books/eog/eog.pdf Accessed in September 2017.
5. 8 Things You (Probably) Didn't Know about Richard the Lionheart. http://www.historyextra.com/article/medieval/8-things-you-probably-didnt-know-about-richard-lionheart Accessed in September 2017.
6. Cynthia Kenyon: Experiments that Hint of Longer Lives. https://www.ted.com/talks/cynthia_kenyon_experiments_that_hint_of_longer_lives Accessed in September 2017.
7. Santosa A, Wall S, Fottrell E, et al. The Development and Experience of Epidemiological Transition Theory Over Four Decades: A Systematic Review. Glob Health Action 2014; 7:23574.
8. Mathers CD, Stevens GA, Boerma T, et al. Causes of International Increases in Older Age Life Expectancy. Lancet 2015; 385(9967):540-8.
9. Immortal Jellyfish: Does it Really Live Forever? https://www.mnn.com/earth-matters/animals/stories/immortal-jellyfish-does-it-really-live-forever Accessed in September 2017.
10. Zhang Y, Kim MS, Jia B, et al. Hypothalamic Stem Cells Control Ageing Speed Partly Through Exosomal Mirnas. Nature 2017; 548(7665):52-57.
11. Downing A, Morris EJ, Corrigan N, et al. High Hospital Research Participation and Improved Colorectal Cancer Survival Outcomes: A Population-Based Study. Gut 2017; 66(1):89-96.