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Hyperbolic Medicine

Jesús M. González-González

Doctor of Medicine and Surgery (University of Alicante). Specialist in Stomatology (University of Murcia). Practice in a Private Dental Clinic, in Salamanca (Spain)
gongonjm[at]hotmail.com

Abstract: ***The concept of hyperbolic medicine includes aspects such as: The conical perspective represents images that travel at the speed of light to the observer's eye, following hyperbolic curves of space-time. The hyperbolic images that animals perceive depend on the number and position of the eyes in their body, as well as the type of rods and cones they have in their eyes. The space-time relativity perpendicular to the movement of each organ is present in this hyperbolic adaptation. Human vision is hyperbolic because the space in which we live is deformed at any longitude and latitude of the terrestrial geography. In the physiology of the human body there are hyperbolic curves that are similar to the lines of force of a magnet and the Earth's magnetic field. Human physiology can be conditioned by general hyperbolic curves and by local hyperbolic curves. Circadian rhythms are adapted to the hyperbolic space in which we live. Hyperbolic human physiology can be fragmented like a magnet into smaller ones and this is repeated on smaller scales as in a fractal. Diseases can be studied as expansion-contraction systems and they are physiological processes that can be modified by acting in their development time and space.***

Keywords: hyperbolic, medicine, space-time, physiology, electromagnetic

1. Introduction

We call "Hyperbolic Medicine" the study of hyperbolic curves that occur in the physiology of a living being, especially in humans, about other hyperbolic curves that may be in nature, such as electromagnetic fields, moving expansion-contraction systems, circadian rhythms, and space-time relativity [1-3].

A "hyperbolic curve" is an open geometric figure with two branches, which is obtained by cutting a right cone by a plane oblique to the axis of symmetry. The plane does not have to be parallel to the axis of the cone and the hyperbola will be symmetric in any case [4] (Figure 1).

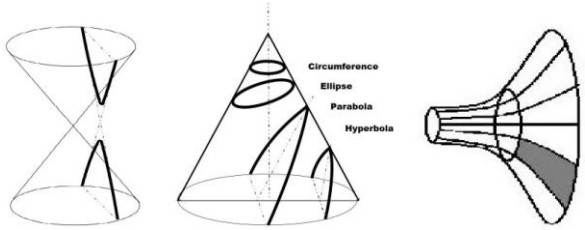

Figure 1: Geometric image of a hyperbola

It has been pointed out that the human eye perceives the space around us as a hyperbola [5]. The images of nature are hyperbolas because the deformed space in which we live is hyperbolic [1, 2, 6-11]. It is described that, when we observe an object, the conical perspective that humans perceive of that image is not parallel lines that converge in a point, but hyperbolic curves of space-time [3] (Figure 2). In a simple magnet and the Earth's magnetic field, there are lines of force that follow a hyperbolic pattern [12, 13]. According to previous works, the closest houses are perceived as larger than the furthest ones because the trajectory of this image to the eye of the observer does not go in a straight line, but through a hyperbolic curved line that is similar to the lines of force of a magnetic field.

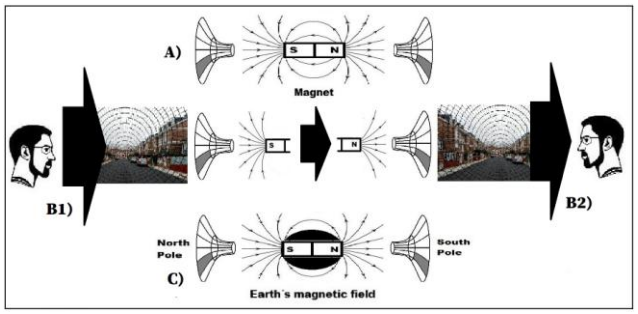

Figure 2: Conical perspective on a street in Salamanca (Spain). The houses farthest from the observer are smaller for him because he sees a hyperbolic image, moving away (B1) or approaching him (B2). The lines of force of a magnet (A) and the Earth's magnetic field (C) are also hyperbolic images.

The brain analyzes the disparity and parallelism of the images it receives to calculate the distances to the perceived object. In this way, the brain perceives a hyperbolic image from a conical perspective. Animals with lateral vision, fewer eyes, and fewer visual pigments would better perceive the closest part of the hyperbolic image (Figure 3A). On the contrary, animals that have binocular vision, a greater number of eyes, and a greater quantity of visual pigments make better calculations in the distance. This allows them to better see the farthest part of the hyperbolic image (Figure 3B) [14].

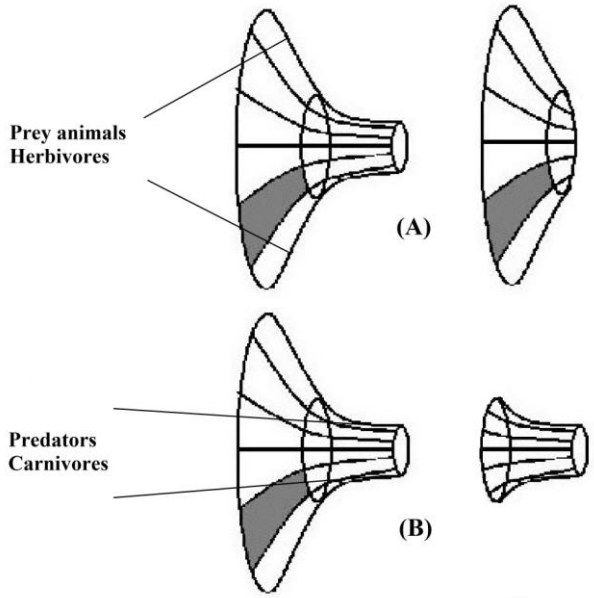

Figure 3: Animals with lateral vision better perceive the closest part of the hyperbolic image (A). Animals with binocular vision better perceive the farthest part of the hyperbolic image (B).

In human physiology and nature, hyperbolic curves are very frequent [1, 6] (Figure 4) (Table 1).

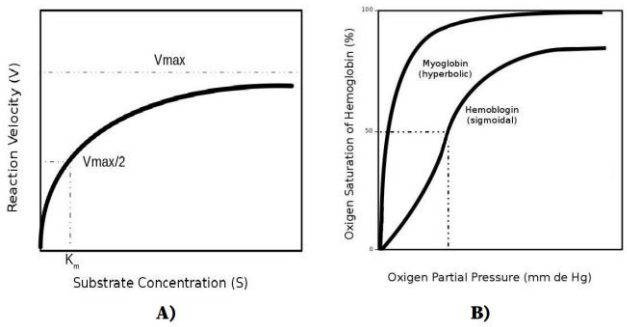

Figure 4: Hyperbolic curves in human physiology: Michaelis-Menten equation in enzyme kinetics (A). Oxygen saturation curves for hemoglobin and myoglobin versus partial pressure of oxygen (B).

Table 1: Hyperbolic curves in physiology

- Oxygen saturation for hemoglobin and myoglobin about partial oxygen pressure [15-18].
- Sometimes dose-effect relationship curves [19].
- Glucokinase and fructokinase saturation curves [20].
- Aspartate saturation curves [21].
- Insulin sensitivity in oral glucose tolerance test [22, 23].
- Heart rate responses during exercise [24].
- Strength-speed ratio of myocardial myosin isoenzymes [25].
- Force-speed ratio of shortening of skeletal muscle fibers [26].
- In aviation, periods of incapacitation in extreme gravitational stress [27].
- Descriptions of the perception of odors, in an olfactory space [28].
- The human eye perceives a hyperbolic image of reality [5].

It is also known that electromagnetic fields have effects on human physiology [29-32] (Table 2).

Table 2: Effects of electromagnetic fields on human physiology

- There are effects on nerves, heart tissue, skeletal muscle, and other body tissues.
- Some cells move towards the cathode (fibroblasts, keratinocytes, chondrocytes, epithelial cells) and others towards the anode (corneal endothelial cells, granulocytes, vascular endothelial cells), but this depends on the animal species.
- Some molecules produce permanent dipoles that align with the applied electric field.
- Ion channels and receptors in the cell membrane can be altered by modifying the kinetics of activation.
- Electromagnetic fields can regulate the speed and amount of products of biochemical reactions.
- Earth's magnetic field also influences the geomagnetic orientation and navigation of some fish, migratory birds, butterflies, and bees.

Related to the above are biological rhythms. These are repeated in time and are related to the rotation of the Earth on its axis and around the Sun [33]. It has been described that the time and rhythms of the biological clock are in the genetic code. These are regulated by environmental activity (rest, sound, light, temperature, humidity) and are synchronized to approach the stimulus frequency [33, 34]. These human circadian rhythms can follow hyperbolic curves [10, 11] (Table 3).

Table 3: Some human circadian rhythms

- Respiratory rhythm: every 6 seconds.
- Heart rate: every 1 second.
- Menstruation: 28 days
- Testosterone and cortisol: maximum at 8: 00 hours and minimum at 22: 00 hours.
- Melatonin: light decreases production, darkness increases it.
- Salivary flow: maximum between 6-14 years and decreases after 20 years. It is more in men, more by day and less by night.

According to the Theory of Relativity, an object that moves on an X-axis, perpendicular to the line of sight of an observer, contracts that length X and its time dilates, while its dimensions Y and Z, perpendicular to that direction of movement, are not altered [35, 36]. According to current works, it is different if that object moves perpendicular to the line of sight of an observer, or if it moves away or approaches in the same line of sight [1, 6-9]. These works indicate that when the object moves away from the observer along its line of sight, he perceives the dimensions Y and Z, perpendicular to the movement of the object, each time smaller, for which he interprets that there is a contraction. If the object approaches an observer in the same line of sight, the observer perceives its height (Y) and its width (Z), each time larger, for which he interprets that those dimensions Y and Z, perpendicular to the axis of movement, have become dilated [1, 6-9] (Figure 5) (Table 4).

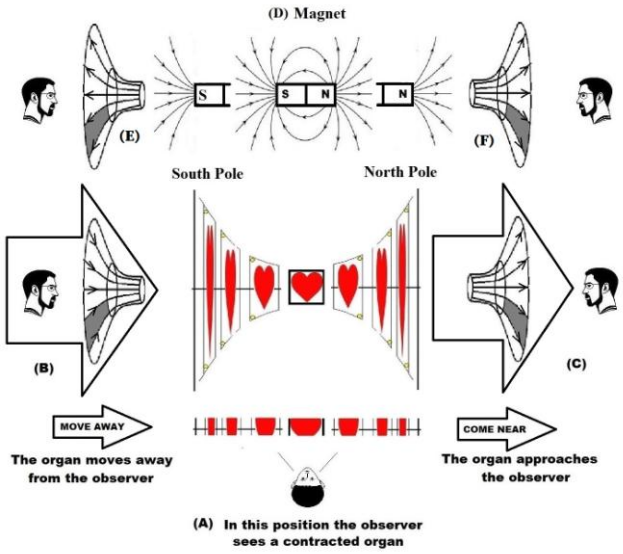

Figure 5: When an organ moves perpendicular to the observer's line of sight, he sees it contracted (A). If the organ moves in the same line of sight as the observer, he sees a hyperbola moving away (B) or approaching (C). This is similar to the lines of force of a magnetic field (D). When that organ moves away from the observer, it follows the hyperbolic lines of force that enter through the south pole of the magnet (E). If that organ approaches, it follows the hyperbolic lines of force coming out of the north pole of the magnet (F).

Table 4: The classical theory of relativity and the results of a previous study by the author

Classical theory of Relativity . Object moves perpendicular to the observer´s line of sight	Length X parallel to the axis of movement contracts by a factor K= $\sqrt{1 - v^2/c^2}$
	Time t_x parallel to the axis of movement dilates by a factor K= $\frac{1}{\sqrt{1- v^2/c^2}}$
Results of a previous study by the author. Object approaches or moves away from the observer in his same line of sight	Lengths Y and Z perpendicular to the axis of movement: * When the organ approaches the observer these lengths dilate by a factor K= $\frac{1}{\sqrt{1- v^2/c^2}}$ * When the organ moves away from the observer these lengths contract by a factor K= $\sqrt{1 - v^2/c^2}$
	Times t_y and t_z perpendicular to the axis of movement: * When the organ approaches the observer these times contract by a factor K= $\sqrt{1 - v^2/c^2}$ * When the organ moves away from the observer these times dilate by a factor K= $\frac{1}{\sqrt{1- v^2/c^2}}$

In both cases, the observer perceives hyperbolic images, when the organ moves away or when it approaches. The contraction factor perpendicular to the movement, calculated as $K=\sqrt{1-v^2/c^2}$ [7], can be transformed into $1/K^2=1-c^2/v^2$, which is hyperbola in the distance (v: velocity of a moving organ, c: speed of light in the vacuum) [6]. The expansion factor perpendicular to the movement $K=1/\sqrt{1-v^2/c^2}$ calculated in previous works [7], can be transformed into $1/K^2=1-v^2/c^2$ and it gives us the hyperbola in approximation [6]. It has been pointed out that when an organ moves away from the observer, it does so along the hyperbolic lines of force that enter through the south pole of a magnet [6] (Figure 5E). When the organ approaches an observer, it does so along the hyperbolic lines of force that emerge from the north pole of a magnet [6] (Figure 5F). If we divide hyperbolic human physiology or divide a magnet into several fragments we get similar patterns. In both cases, they repeat their hyperbolic characteristics as if they were fractals [6] (Figure 6).

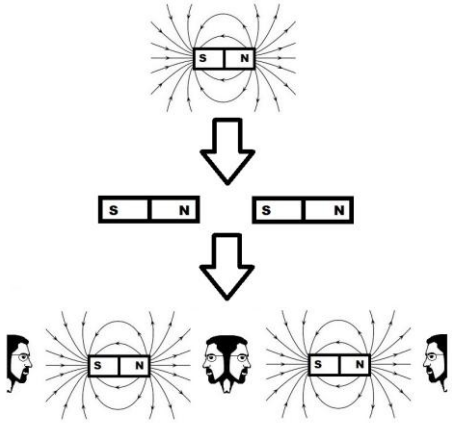

Figure 6: Human physiology and a magnet can be divided into smaller fragments, which maintain the same hyperbolic characteristics.

The objective of this work is to collect all the information related to hyperbolic medicine to define its characteristics as a science different from other medical specialties.

2. Material and methods

In Internet search engines and various databases (Medline, Scielo) a bibliographic review of scientific works in medicine has been made, about hyperbolic curves, expansion-contraction systems in movement, circadian rhythms, fractals, and space-time perpendicular to the movement of an organ. With the information obtained, the concept of hyperbolic medicine has been established as a science different from other medical specialties.

3. Results

1) The conical perspective is the one that comes closest to the real vision of the human being and forms a conical beam of parallel lines, which converge at some point of the representation [37-39] (Figure 1). According to previous works, these parallel lines are hyperbolic curves of space-time [1-3, 6-11].
2) Animals with lateral vision, fewer eyes, and fewer visual pigments see better the closest part of the hyperbolic image. On the other hand, animals with binocular vision, a greater number of eyes, and a greater quantity of visual pigments see the farthest part of the hyperbolic image better. [14].
3) There is space-time relativity, perpendicular to the movement axis of an organ, which gives hyperbolic curves [1, 6-9].
4) Images in nature are “general hyperbolas” and exist independently of the longitude and latitude of the Earth where they are observed [2].
5) The lines of force of the Earth's magnetic field are "local hyperbolas" [2], which can vary over time and even reverse their polarity [40].
6) Hyperbolic curves are very frequent in human physiology [1, 5, 6, 15-28] and can be influenced by general and local hyperbolic curves.

7) Electromagnetic fields have effects on human physiology [29-32] and act through local hyperbolic curves, that is, those generated by that electromagnetic field.
8) Human circadian rhythms can be synchronized with the hyperbolic curves that occur in nature [10, 11], through general and local hyperbolic curves.
9) Hyperbolic human physiology and a magnet can be fragmented into smaller elements and they maintain their same characteristics at smaller scales as if they were a fractal [41, 42].
10) Diseases can be studied as an expansion-contraction system that moves at different speeds [43-47]. There is the possibility of modifying the hyperbolic dimensions of these physiological processes, when we act in their time and space of development, to serve in the treatment of diseases [7, 8].

4. Discussion

The concept of hyperbolic medicine encompasses various aspects (Figure 7). Its main characteristic is that the hyperbolic space-time curves found in nature are related to and influence human physiology.

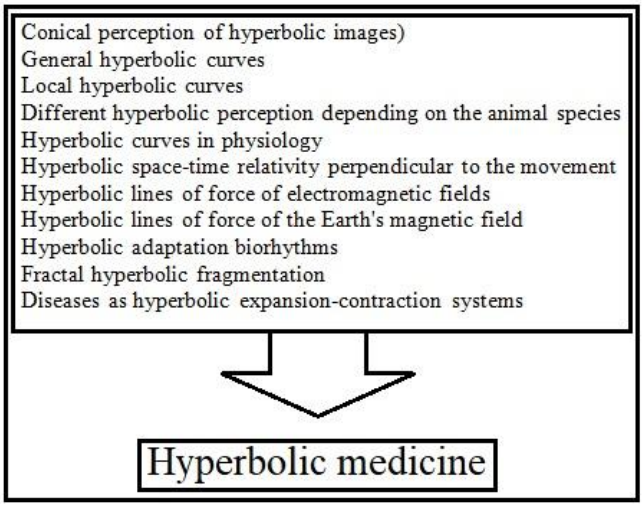

Figure 7: Aspects related to hyperbolic medicine.

Conic perspectives are hyperbolic curves of space-time [3]. When we see a moving image, the lines become curved and we observe a hyperbola [1, 2, 6-9]. When we look at houses of equal size, the closest ones are perceived as larger than the ones further away. The image of each house moves to the human eye at the speed of light. However, the path of this image to the observer's eye does not go in a straight line, but through a curved line that is similar to the lines of force of a magnetic field (Figures 2 and 3).

We know from previous works [2] that hyperbolic curves occur at any longitude and latitude of the terrestrial geography. They are there, they are independent of other circumstances and therefore they are “general hyperbolic curves”. In contrast, the Earth's magnetic field generates "local hyperbolic curves," which can vary over time and even reverse their polarity. It is known that the Earth's magnetic field has reversed on multiple occasions, in different geological epochs [40].

The results obtained indicate that hyperbolic curves are very common in medicine and are found in many human physiological processes [15-28]. It is possible to think that human physiology is conditioned by that deformed space in which we live. In this way, the hyperbolic curves that we see in medicine could be related to this hyperbolic deformation. Some hyperbolic curves that occur in human physiology may be conditioned by the local hyperbolic curves of the Earth's magnetic field. But there may also be an adaptation of human physiology to the general hyperbolic deformation of the space in which we live.

We know that electromagnetic fields have effects on human physiology [29-32] and hyperbolic curves are very common in that physiology. The magnetic field that surrounds us warps our space and makes it curved. If we observe the lines of force of a magnet and the earth's magnetic field, we see that they are hyperbolic images [12-14]. Some hyperbolic curves that occur in human physiology may be conditioned by the hyperbolic curves of the earth's magnetic field. There is an adaptation of human physiology to this hyperbolic deformation of the space in which we live.

Geomagnetic rhythms can act as a time clock to organize physiological rhythms. This means that human biorhythms follow hyperbolic curves, synchronized with the local hyperbolic lines of the Earth's magnetic field. If external stimuli are applied to modify the hyperbolic physiological curves, they tend to synchronize again to return to being hyperbolic. Cellular physiological processes have a permanent synchronization [11]. The cells of the human body synchronize their physiological processes to create similar hyperbolic curves. There is a close interaction between geomagnetic and biomagnetic fields throughout evolution [10, 11, 29-34]. There may be a "long life biorhythm", which goes from birth to death. At birth, that "long life biorhythm" appears in the cellular physiology and becomes hyperbolic by synchronizing with the local hyperbolic lines of force of the Earth's magnetic field. We assume that the general hyperbolic curves influence this synchronization [11].

The coastline of an island is irregular and is considered a fractal [48]. If a portion is viewed at higher magnification, it remains irregular and this is repeated at different scales. The space we observe is hyperbolic and we can fragment it into smaller portions that repeat themselves as a fractal does. This is because it is a geometric object whose irregular structure is repeated at different scales. We can also fragment human physiology into smaller portions as we do with a magnet and in each of them, its hyperbolic characteristics are repeated as if it were a fractal [6] (Figure 6).

5. Conclusions

The concept of hyperbolic medicine as a science different from other medical specialties encompasses various aspects, among which are the following:

1) The conical perspective represents images that travel at the speed of light to the observer's eye, following hyperbolic curves of space-time (conical perception of hyperbolic images).

2) The hyperbolic images that animals perceive depend on the number and position of the eyes in their body, as well as the type of rods and cones they have in their eyes. Animals with lateral vision have their perception in the closest part of a hyperbolic image, while animals with binocular vision have it in the farthest part of that hyperbolic image (different hyperbolic perceptions depending on the animal species).
3) The space-time relativity perpendicular to the movement of each organ is present in this hyperbolic adaptation (hyperbolic space-time relativity perpendicular to the movement).
4) Human vision is hyperbolic because the space in which we live is deformed at any longitude and latitude of the terrestrial geography (general hyperbolic curves).
5) The lines of force of the Earth's magnetic field are hyperbolas that can vary in intensity and even reverse their polarity over time (local hyperbolic curves).
6) In the physiology of the human body there are hyperbolic curves that are similar to the lines of force of a magnet and the Earth's magnetic field. Human physiology can be conditioned by general hyperbolic curves and by local hyperbolic curves. There is an adaptation to this hyperbolic deformation of the space in which we live. This conditions human physiology giving hyperbolic patterns of adaptation (hyperbolic curves in physiology).
7) Electromagnetic fields influence human physiology through hyperbolic curves (hyperbolic lines of force of electromagnetic fields).
8) Circadian rhythms are adapted to the hyperbolic space in which we live (hyperbolic adaptation biorhythms).
9) Hyperbolic human physiology can be fragmented like a magnet into smaller ones and this is repeated on smaller scales as in a fractal (fractal hyperbolic fragmentation).
10) Diseases can be studied as expansion-contraction systems and they are physiological processes that can be modified by acting in their development time and space (diseases as hyperbolic expansion-contraction systems).

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Author Profile

González-González, Jesús M. Ballicher of Medicine, University of Salamanca (1985). Doctor of Medicine and Surgery, University of Alicante (1992). Specialist in Stomatology, University of Murcia (1992). Medical practitioner of State Health Service, 1987-1990. Dentist of State Health Service, 1991-2. Private practice in Stomatology 1991-present. Masters: 5. Attendance at medical courses: 74. Attendance at other courses: 10. Published books: 11. Collaboration in books: 1. Published manuscripts: 72. Other publications: 5. Founder President of APFS-Salamanca y PNH 2003-14. President or member of the conference organizing committee: 13. Reports in congresses: 28. Short films: 1. Patents: 7. Honour mention: 7. Participation in the media, press, radio, television: 36.