Hyperbolic Curves in Medicine and the Earth's Magnetic Field

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Abstract: ***Introduction**: The relationship between the hyperbolic curves that occur in human physiology and those that occur in the Earth's magnetic fields are described. **Methods**: Hyperbolic curves in medicine and theory of relativity were studied. **Results**: There are hyperbolic curves in human physiology. Diseases can be studied as an expansion-contraction system that moves with different speeds and sometimes it reminds of the concept of fractal. **Conclusions**: The deformed space in which we live is hyperbolic. 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. Hyperbolic human physiology can be fragmented just like a magnet does in smaller ones and this is repeated on smaller scales as in a fractal. When a moving organ approaches an observer, it follows the hyperbolic lines of force that come out of the north pole of a magnet. The dilation factor perpendicular to the movement is 1/K2 = c2-v2/c2. When a moving organ moves away from an observer, it follows the hyperbolic lines of force that enter through the south pole of a magnet. The contraction factor perpendicular to the movement is 1/K2 = c2 / c2-v2.*

Keywords: hyperbolic, physiology, human, magnetic, relativity

1. Introduction

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

In human physiology, hyperbolic curves are very common. Thus, for example, we have the heart rate responses induced by different load intensities during exercise, in a bicycle ergometer [2]. When the force-velocity relationships of two myosin isoenzymes in the rat ventricular myocardium were studied, the force-velocity curves adopted a hyperbolic form in the low force range [3]. Also the force-speed ratio of shortening of skeletal muscle fibers of frog gives a hyperbolic curve [4]. There is a hyperbolic relationship between fasting insulin sensitivity and acute insulin response in subjects with decreased glucose tolerance [5,6]. However, the most characteristic hyperbolas are those that occur as oxygen saturation curves for hemoglobin and myoglobin versus partial oxygen pressure. Oxygen saturation for myoglobin is hyperbolic under conditions of suppressed metabolic activity, while it becomes sigmoid by improving metabolism with activity and oxygenation [7-9]. In a study of fifteen peptide complexes with the oxygen-binding heme group (to serve as blood substitutes in the absence of blood donors) they gave hyperbolic oxygen saturation curves [9,10]. It is also known that glucokinase has two optimal pH (pH 7.0 and 8.2), while fructokinase has an optimal pH (pH 7.4) and both give hyperbolic saturation curves [11]. In the absence of effectors, the aspartate saturation curve is hyperbolic, but it becomes sigmoidal in the presence of low concentrations of triphosphate nucleotides [12]. In some cases the dose-effect relationship is a hyperbolic curve [13]. A hyperbolic geometry of the olfactory space has also been described, as humans describe natural odors using a hyperbolic space [14] In aviation, extreme acceleration (+ Gz) involves extreme gravitational stress that sometimes causes loss of consciousness. This period of incapacitation describes a hyperbolic relationship, which indicates that there is a minimum time to recover consciousness [15] (Fig. 2). It has also been described that the space that humans perceive is hyperbolic, because they tend to overestimate small angles and underestimate large angles [16-19] (Fig. 3).

In nature there are also hyperbolic curves as in human physiology. In fact, the Earth's magnetic field has lines of force that follow a hyperbolic pattern. In a simple magnet, lines of force similar to those of the Earth's magnetic field have also been described [20, 21] (Fig. 4).

We know from previous work that diseases can be studied as an expansion-contraction system that moves with different speeds [22-26]. This sometimes reminds the concept of fractal [27,28]. The theoretical possibility of teleporting humans and their organs in the treatment of cancer has also been described [16]. This would give the possibility to modify the hyperbolic spatial dimensions of an organ by traction of them in a controlled way, to modify biological processes acting in their development time and space. This attempts to find a new way of treating diseases [17].

The hypothesis is that the hyperbolic curves that occur in human physiology may be related to those that occur in the Earth's magnetic fields and with their spatio-temporal dimensions.

The aim of this work is to describe this relationship, in order to act on it and thus establish new forms of disease treatment.

2. Materials and Methods

A bibliographic review of scientific works on hyperbolic curves in medicine has been made in various databases (Medline, Scielo) and in Internet search engines using Osint techniques (open source intelligence techniques), to select those articles considered of greatest interest for this work. The theory of relativity has been revised [29-31] and some previous works of this author have been taken into account [16-18,22-28]. From the data collected, a theoretical description of the relationship between the hyperbolic curves that occur in human physiology and those of the Earth's magnetic field has been made.

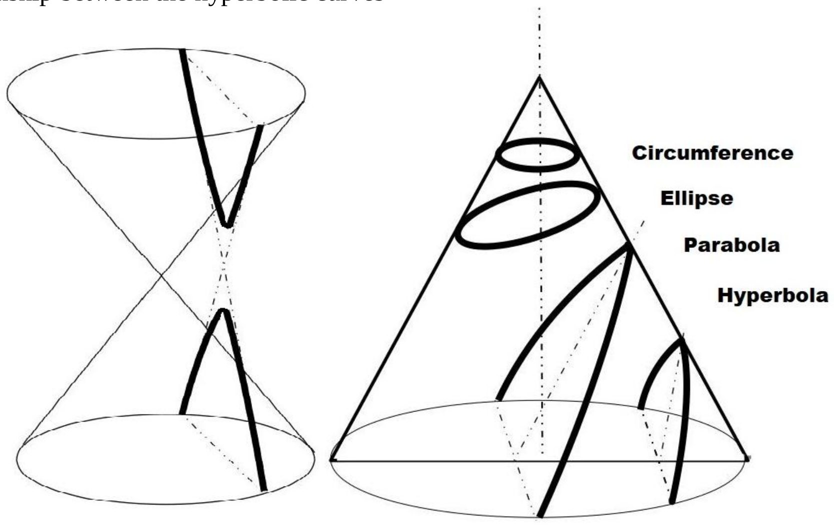

Figure 1: Geometric image of a hyperbola

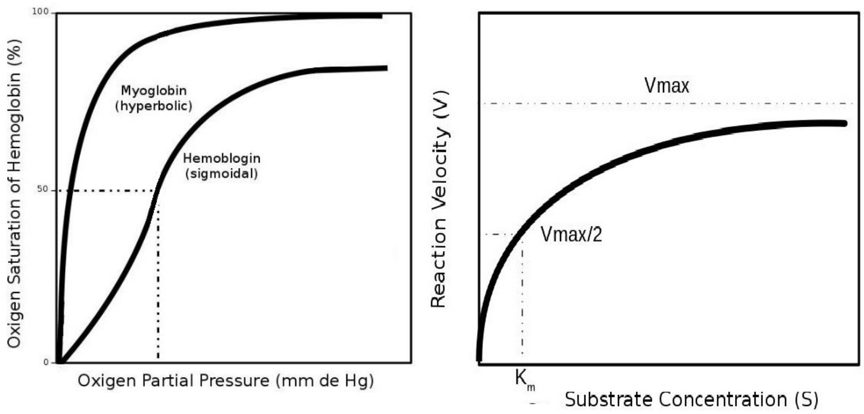

Figure 2: Hyperbolic curves in human physiology: Oxygen saturation curves for hemoglobin and myoglobin versus partial oxygen pressure (A). Michaelis-Menten equation in enzymatic kinetics (B).

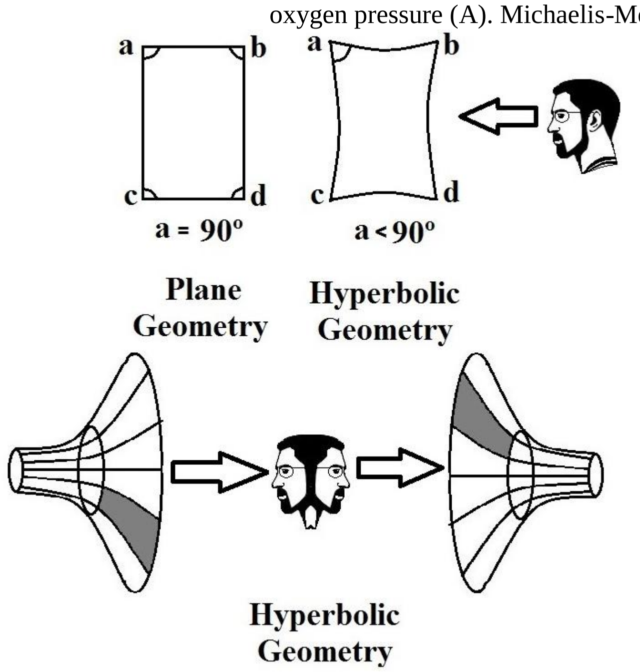

Figure 3: An observer sees reality as a hyperbolic image, so that the 90º angles of a rectangle are perceived smaller than 90º.

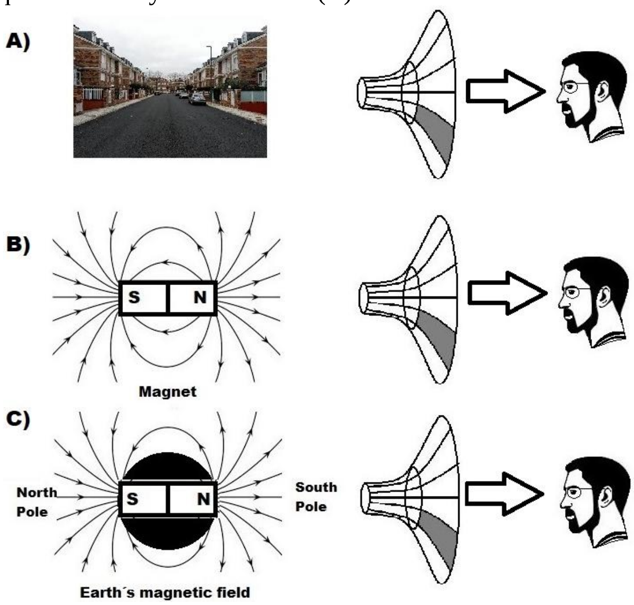

Figure 4: The houses farther from the observer are smaller for him, because he sees a hyperbolic image (A). When an observer sees the pole of a magnet the lines of force are also hyperbolic (B). The same happens with the Earth´s magnetic field (C).

3. Results

The results indicate that there are:

a) Hyperbolic curves in physiology (Fig. 2, 3):
   - Heart rate responses during exercise [2].
   - Strength-speed ratio of myocardial myosin isoenzymes [3].
   - Force-speed ratio of shortening of skeletal muscle fibers [4].
   - Insulin sensitivity in oral glucose tolerance test [5,6].
   - Oxygen saturation for hemoglobin and myoglobin in relation to partial oxygen pressure [7-10].
   - Glucokinase and fructokinase saturation curves [11].
   - Aspartate saturation curves [12].
   - Sometimes dose-effect relationship curves [13].
   - Descriptions of the perception of odors, in an olfactory space [14].
   - In aviation, periods of incapacitation in extreme gravitational stress [15].
   - The human eye perceives a hyperbolic image of reality [16-19].

b) The lines of force in a magnet and in the Earth´s magnetic field are hyperbolic images [21,32] (Fig. 4).

c) Diseases can be studied as an expansion-contraction system that moves with different speeds [22-26]. Sometimes it reminds of the concept of fractal [27,28]. There is the possibility of modifying the hyperbolic dimensions of a physiological process, when we act in its time and space of development, to serve in the treatment of diseases [16,17].

4. Discussion

The results obtained indicate that hyperbolic curves are very common in medicine and are in many human physiological processes [2-15]. Such curves are also very present in the nature. There is a great similarity between the lines of force of the Earth's magnetic field, which are hyperbolic [20,21] and those that occur in human physiology. It has been described that the human eye perceives the space around us as a hyperbola. This hyperbolic image of reality may be distorted by the human eye, but it can also be caused by magnetic lines that deform the space in which we live. In this way, in a deformed space the lines are observed by the human eye as curves, or more exactly as hyperbolas. If this were true, the images we observe of reality are hyperbolas because the magnetic field around us deforms the space until it is curved. This deformation does not depend on the country, but occurs anywhere in space.

When we look at houses of equal size, the closest ones are perceived larger than the farthest ones (Fig. 4). The image of each house is transferred to the human eye at the speed of light. However, the path this image to the eye of the observer does not go in a straight line, but through a curved line that is similar to the lines of force of a magnetic field.

When a vehicle with an organ inside (heart) moves towards an observer, he perceives its lengths perpendicular to its movement are increasing. On the contrary, if the vehicle moves away from the observer, he perceives that these lengths perpendicular to the movement are smaller. In any case, the observer sees a hyperbolic image of the vehicle, when it approaches or when it moves away [16-18] (Fig. 5A).

The above can be explained because these images reach the eye of the observer at the speed of light. Fot that, these images follow hyperbolic curves that have their origin in a magnetic field that deforms the space around us. Then it is posible 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 that hyperbolic deformation.

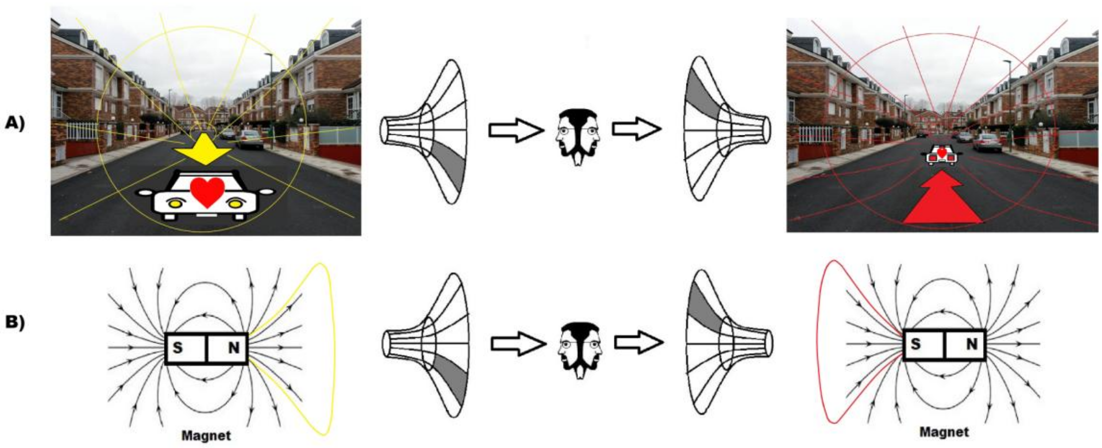

Figure 5: When an observer sees an organ (heart) inside a vehicle that is approaching, he finds the lengths perpendicular to its movement are increasing

When the organ moves away from him, he finds that those lengths are contracting (A). In both cases the observer sees a hyperbolic image of the organ, similar to the lines of force of the magnetic field. When that organ approaches the observer, it follows the hyperbolic lines of force that come out of the north pole of the magnet. If that organ moves away, it follows the hyperbolic lines of force that enter through the south pole of the magnet (B).

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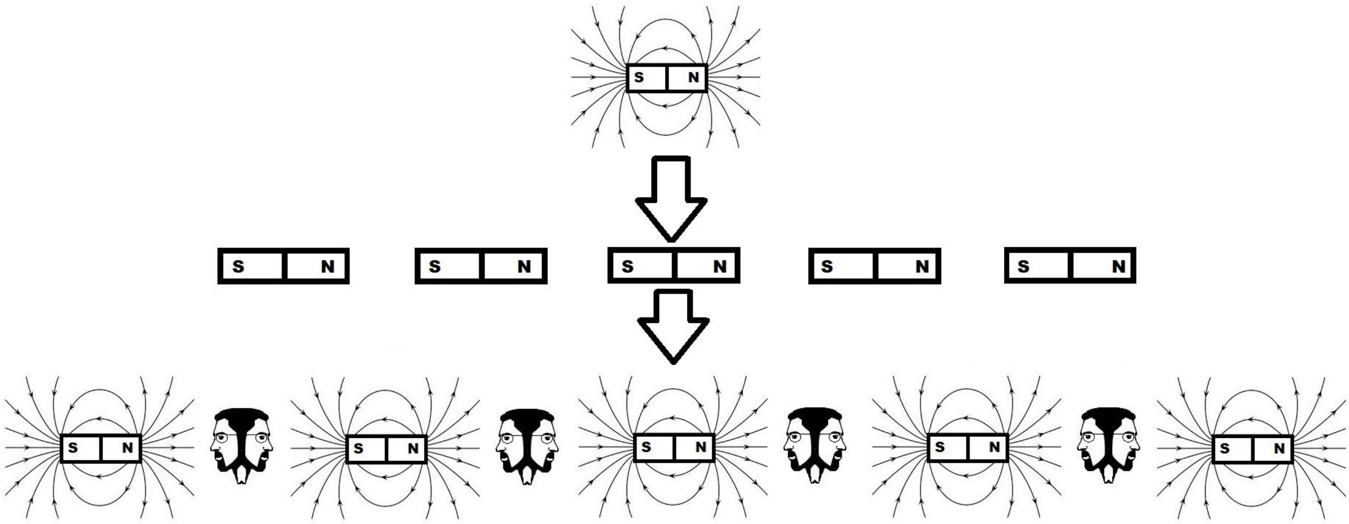

Figure 6: If we split a magnet into several fragments we get similar magnets. If we place an observer in the middle of these fragments, the hyperbolic lines of force approach the observer from the north pole N, while those hyperbolic lines of force move away from the observer towards the south pole S.

For a better understanding we can fragment that space into two parts: in the first, the vehicle approaches the observer according to hyperbolic lines of force that exit through the north pole of a magnet and in a second part, the vehicle moves away from the observer according to hyperbolic lines of force that enter through the south pole of a magnet (Fig. 5B). This fragmentation reminds a fractal, since it is a geometric object whose irregular structure is repeated at different scales [33-35]. The coastline of an island is irregular. If a portion is observed 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 like a fractal does. We can also fragment a magnet into smaller portions and in each of them its hyperbolic characteristics are repeated as if it were a fractal (Fig. 6). According to previous work we know that it is possible to study diseases as an expansion-contraction system with ruptures in a plane [22-26] and that sometimes they remind fractals [27, 28]. The relationship between hyperbolic curves and these expansion-contraction systems are the current object of study by this author.

The dilation factor perpendicular to the movement was calculated in a previous work [16] and it is $K = 1/\sqrt{1-v2/c2}$ (v = speed of an organ (heart) inside a moving vehicle, c = speed of light). If we transform that equation into $1/K2 = c2-v2/c2$ it gives us the hyperbola when the organ approaches the observer. The contraction factor perpendicular to the movement calculated [16] as $K = \sqrt{1-v2/c2}$ can be transformed into $1/K2 = c2/c2-v2$, and it gives us the hyperbola when the organ moves away from the observer.

5. Conclusions

1) The human vision is hyperbolic because the deformed space in which we live is hyperbolic.
2) 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. The human physiology may be conditioned by that magnetic field. There is an adaptation to that hyperbolic deformation of the space in which we live.
3) Hyperbolic human physiology can be fragmented just like a magnet does in smaller ones and this is repeated on smaller scales as in a fractal.
4) When a moving organ approaches an observer, it follows the hyperbolic lines of force that come out of the north pole of a magnet. The dilation factor perpendicular to the movement is $1/K2 = c2-v2/c2$.
5) When a moving organ moves away from an observer, it follows the hyperbolic lines of force that enter through the south pole of a magnet. The contraction factor perpendicular to the movement is $1/K2 = c2 / c2-v2$.

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