The Internal Reason of Lifespan Depending on Season of Birth

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Abstract

The human body always follows the ancient rhythm. When the relative space locations of the earth and the sun change, the blood volume every organ of human body gets and the functions of the organs will change synchronously. Before conception, the nutrition obtained by the sperm (from spermatogonium to mature spermatozoa) and the ovarian follicle (from primary follicle to mature follicle) changes with the seasons in Chinese lunar calendar, which may be the most important internal reason of lifespan depending on season of birth.

1. Introduction

In the natural world, not only the reproduction and migration of animals are associated with the season, but also many events are related to the season. Seasonal changes may occur in most of the internal processes[1]. Different seasons bring different diseases[1]. For example, the morbidity rate of breast cancer is the highest in spring, the lowest in autumn and intermediate in winter and summer[2]. However, so far, we still know little about the internal reasons of these phenomena. This article is to reveal the influence of the birth season on human lifespan through the changes of human body operation with the changes of day and night as well as seasons.

2. Materials

1.1 The human body operation changes with time

In the northern hemisphere, genitourinary organs get the most blood and more nutrition in Chinese lunar winter, and get the least blood in Chinese lunar summer. In one day, the urinary organs get the most blood in the local solar time 3-5 pm and reproductive organs get

the most blood in the local solar time 5-7 pm[3]. Figure 1 shows the law of the amount of blood obtained in genitourinary organs changing with the lunar seasons. In Chinese lunar calendar, spring, summer, autumn and winter start when the Sun arrives at 315°, 45°, 135° and 225° celestial longitudes respectively, which are approximately on February 4, May 5, August 7 and November 7 each year.

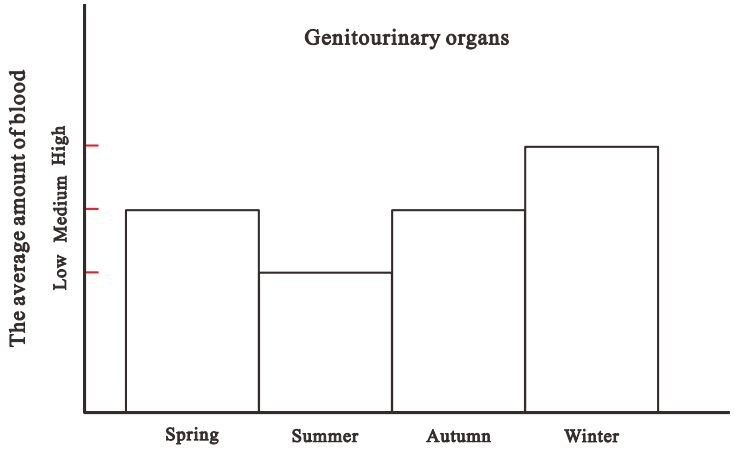

Figure 1. Seasonal Change of Average Blood Amount.

In the northern hemisphere, genitourinary organs get the most blood and more nutrition in Chinese lunar winter, and get the least blood in Chinese lunar summer.

The Commencing of Spring: solar longitude 315° (Feb. 3, 4 or 5)

The Commencing of Summer: solar longitude 45° (May 5, 6 or 7)

The Commencing of Autumn: solar longitude 135° (Aug 7, 8 or 9)

The Commencing of Winter: solar longitude 225° (Nov. 7 or 8)

Explanation of Fig. 1: The natural world operates in accordance to natural procedures. Human beings are of no exception. The human body has its own operational rules. Blood in human body is not as free running as the water in the river, but is controlled by human body. By controlling venous blood flow, the human body controls blood volume flowing from artery to capillary. The human body has a set of control system whose major function is to control the human body to work in line with its own rules (procedures). The human body control system consists of 24 subsystems with 12 in the left and right side of the body respectively. They control blood of corresponding organs and tissues separately. These subsystems are not only relatively independent but also associated with each other. The law of human body determines that blood volume distributed to organs and tissues varies at different times, which means that the nutrition organs and tissues obtained and their functions change with time.

1.2 Diurnal variation of semen parameters in human males

The semen samples were extracted from morning (7: 00-7: 30 am) and afternoon (5: 00-5: 30 pm). Men's semen in the afternoon, especially the number of sperm, and the proportion of rapid movement is relatively large (Table 1.).

Table 1. Change of Semen Parameters[4]

Basal		**Time after swim-up**		
Morning				
Total no. ($\times 10^6$)	127.8 ± 15.5	14.9 ± 1.9		
Concentration ($\times 10^6$/ml)	37.7 ± 4.1			
Motility ($\times 10^6$) (%)				
Rapid progressive	28.3 ± 4.9 (~22)	11.6 ± 1.6 (~78)	9.2 ± 1.4 (~62)	9.6 ± 1.7(~64)
Sluggish progressive	38.5 ± 4.9 (~30)	3.1 ± 0.4 (~21)	4.0 ± 0.5 (~27)	4.6 ± 0.6 (~31)
Non-progressive	13.4 ± 1.8 (~10)	0	1.2 ± 0.2 (~8)	2.3 ± 0.4 (~15)
Immobility	47.5 ± 5.4 (~37)	0	0.2 ± 0.08 (~1)	0.4 ± 0.1 (~3)
Rapid + sluggish	71.4 ± 10.2(~56)	14.8 ± 1.9 (~100)	13.3 ± 1.8 (~89)	14.2 ± 2.1 (~95)
Afternoon				
Total no. ($\times 10^6$)	161.9 ± 22.9^c	16.9 ± 1.9		
Concentration ($\times 10^6$/ml)	48.3 ± 5.0^c			
Motility ($\times 10^6$) (%)				
Rapid progressive	36.2 ± 7.7 (~22)	13.2 ± 1.8^a (~78)	11.8 ± 1.7^b (~70)^b	10.2 ± 1.5^c (~60)^b
Sluggish progressive	45.4 ± 5.3^b (~28)	3.2 ± 0.2 (~19)	4.2 ± 0.3 (~25)	5.0 ± 0.5 (~29)
Non-progressive	19.0 ± 2.8^c (~12)^a	0	0.4 ± 0.1^c (~3%)^b	1.2 ± 0.2^a (~8%)^b
Immobility	61.2 ± 7.9^b (~38)	0	0^c	0^b
Rapid + sluggish	88.2 ± 13.9^a (~55)	16.4 ± 2.0 (100)	16.0 ± 1.9^b (~96)	15.3 ± 1.9^a (~91)

Mean (± SE) sperm number per ejaculate (total), per ml (concentration) and with different motility (percentages calculated on corresponding total number and shown in parentheses) observed in 54 males, with specimens collected in the morning (7:00–7:30 am) and afternoon (5:00–5:30 pm). Mean (± SE) number of recovered spermatozoa at pellet swim-up and number with different motility immediately after, and at 1 and 2 h after pellet swim-up, are also reported.

Tests at Italy's University of Modena found that a man's sperm peaks in potency at 6.25 pm. (August 13, 2015 Daily Mail reported http://www.dailymail.co.uk/femail/article-3195487)

As spermatogenesis is a long process, it is unlikely that diurnal rhythms in sperm quality may derive from diurnal variations in sperm production and maturation. Functional variations in the nerve–muscle mechanisms causing ejaculation are more likely to determine higher or lower concentrations of spermatozoa in seminal fluids. This diurnal variation in sperm motility may derive from influences exerted on spermatozoa by seminal fluid components such as hormones, cytokines, nutrients, amino acids, electrolytes and yet undefined substances either derived from blood or produced locally[4].

1.3 Seasonal variations of semen parameters in human males

The sperm concentration and percentage of fast motility showed a significant decrease from spring (March, April and May) toward summer (June, July and Aug.) and fall (Sept., Oct. and Nov.) with recovery noticed during the winter (Dec., Jan. and Feb.). As well, the highest percentage of normal sperm morphology was observed during the winter (Dec., Jan. and Feb.)[5].

The mean percent fast-motile sperm reached nadir values in the summer (3.45%), improved in the fall (4.92%), and peaked in the winter (5.03%)[5].

1.4 The influences of the season of birth on the lifespan

In two countries of the Northern Hemisphere–Austria and Denmark–people born in autumn (October–December) live longer than those born in spring (April–June). Data for Australia show that, in the Southern Hemisphere, the pattern is shifted by half a year (Figure 2).

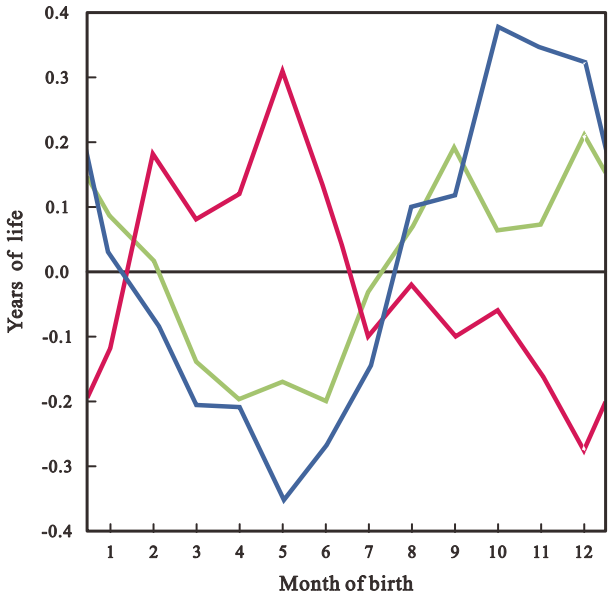

Figure 2. Deviation in remaining lifespan of people born in specific months from the average remaining lifespan at age 50[6]

In the Northern Hemisphere countries of Denmark (green line) and Austria (blue line), the people born in the fourth quarter of the year live longer than those born in the second quarter. For Australia (red line), the pattern is shifted by half a year.

3. Methods and Results

Select and use public research data to conduct time-related analysis based on

experimental data, statistical information as well as the operation of the human body so as to find the relevance among them.

1) Within one day, the reproductive organs obtained the most blood at 5-7 pm[3]. By comparing the sperm samples in the morning and those in the afternoon (Table 1), we found that the number of sperms and the proportion of rapidly moving sperms were relatively larger in sperm samples in the afternoon[4]. These data show that, the increment of blood and the change of some sperm parameters have corresponding relations in terms of time. It seems presumably that when the genital organs get more blood, the function of ejaculation may become stronger, resulting in an increase in the number of sperms in semen. At the same time, the sperms in semen may get more nutrition, resulting in the immediate increase of the proportion of rapidly moving sperms in semen.

During a year, the reproductive organs get the most blood in the lunar winter, and the least in the lunar summer[3]. In the semen samples, The sperm concentration and percentage of fast motility showed a significant decrease from spring (March, April and May) toward summer (June, July and Aug.) and fall (Sept., Oct. and Nov.) with recovery noticed during the winter (Dec., Jan. and Feb.). As well, the highest percentage of normal sperm morphology was observed during the winter (Dec., Jan. and Feb.)[5]. These data show that, the increasing of blood and the changing of semen parameters had corresponding relations in terms of time. It seems presumably that when the reproductive organs are in the season when they can get more blood, the function of ejaculation may become larger, causing a greater number of sperms in the semen. At the same time, sperm may get more nutrition, resulting in a larger percentage of rapidly moving sperms in the semen. However, the percentage of sperms in normal morphology is the highest in winter (Dec., Jan., Feb.)[5], which may be the result of sperms getting more blood in the process from the production to the maturation.

Since the change of blood volume obtained by reproductive organs may cause some changes in semen parameters, the factors influencing human body lifespan in sperms may be influenced positively and lead to a longer lifespan if the sperms get more blood nutrition in the process from the production to the maturity.

2) In two countries of the Northern Hemisphere–Austria and Denmark–people born in autumn (October–December) live longer than those born in spring (April–June)[6]. By comparing Figure 1 and Figure 2[6], we can find that for the people who born in Austria and Denmark in autumn (October–December), from the production to the maturity, the sperms

which brought them lives stayed in winter of Chinese lunar calendar for a long time, during which the sperms got more nutrition; for the people born in spring (April–Jun e), from the production to the maturity, the sperms that brought them lives stayed in summer of Chinese lunar calendar for a long time, during which the sperms got less nutrition. Analysis shows that, the increase of lifespan and blood has certain relation in terms of time. It seems presumably that longer lifespan of people born in autumn (October–December) is related to more nutrition the sperms get from the production to the maturity. If we calculate the regeneration cycle of ova from the development of primary follicle, the influence of seasonal variation of blood on ova is similar with that on sperms.

The blood pattern of reproductive organs in lunar winter and summer are consistent with increased lifespan, which may reasonably explain why the people born in autumn (October–December) live longer than those born in spring (April–June).

In conclusion, the seasonal variation of blood volume obtained by human reproductive organs causes the nutrition sperms and ova get in the process from the production to the maturity vary with the seasons. Although more internal factors may influence the lifespan, the seasonal change of blood volume may be the most important internal reason.

4. Discussion

Regarding the changes of semen parameters in one day, tests at Italy's University Of Modena found that a man's sperm peaks in potency at 6.25 pm, 6:25 pm is about 6 o'clock pm in local solar time (Modena University is located in 10.9-degree east longitude, and the equation of time is about 16 minutes). The reproductive organs get the most nutrition at 6 o'clock pm in local time. It can be speculated according to the experimental data that the peak of sperms occurs at 6 o'clock pm in local solar time when the sun arrives at 270-degree celestial longitude (around December 22th) in a year of the Northern hemisphere. If it is in early morning or late night when the sun arrives at 270-degree celestial longitude, the peak may occur in the previous day or the next day.

In Figure 2, the influence of the season of birth on lifespan in Australia of the southern hemisphere is shifted by half a year compared with that in Austria and Denmark of the northern hemisphere[6]. This phenomenon may reveal the unknown functions of the human body that the human body system not only has the ability to distinguish east longitude and west longitude, but also the ability to distinguish southern hemisphere and northern

hemisphere. When people move from northern hemisphere to southern hemisphere, the human body will adjust itself accordingly. The season when genitourinary organs get the most blood is changed to the period starting from the sun arriving at 45-degree celestial longitude and the season when genitourinary organs get the least blood is changed to the period starting from the sun arriving at 225-degree celestial longitude

(Note: In winter or summer of Chinese lunar calendar, it can be measured whether the semen parameters have great changes and the time that human body system needs to make adjustment by extracting the semen samples in northern hemisphere and southern hemisphere from the same person. In addition, the relatively great changes of some semen parameters can be measured by extracting the semen samples around the season shift of Chinese lunar calendar from the same person.)

The factors influencing lifespan include internal reasons as well as external reasons. If the man and woman cannot get adequate food within 90 days before conception or the pregnant woman cannot get adequate food after conception, the sperm (from spermatogonium to mature spermatozoa), ovum (from primary follicle to ovum), embryo and fetus will not get normal nutrition in the development process. The health of new-born babies and their health and lifespan after old age will be influenced negatively.

Regarding the birth season deciding lifespan, it is related to food shortage in winter according to the previous mainstream opinions. However, the population statistics made by Britain in 2011 shows there are still differences on lifespan even though the food is improved (Media reported).

5. Conclusion

The blood pattern of reproductive organs in Chinese lunar winter is consistent with increased lifespan. Before conception, the nutrition sperms (from spermatogonium to mature spermatozoa) and ova (from primary follicle to ova) obtained in about 90 days vary with the changes of seasons of Chinese lunar calendar, which may be the most important internal reason of lifespan depending on season of birth.

Acknowledgements

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Appendix A: Running Mode of Human Body

In the solar system, the sun gives off light and heat to provide energy. The earth and moon move around the sun, the moon moves around the earth and the earth and moon also rotate around their own axes. These rotations form the days and nights, the four seasons of the earth as well as the environment suitable for living. The human beings and other creatures born on the earth are closely related to these rotations.

When relative space locations of the earth and the sun change, the blood volume every organ of human body gets and the functions of the organs and tissues will change synchronously. The human body works in accordance to rotations and revolutions of the earth. The blood volume that human body system allocates to every organ and tissues inside human body changes during the day and so do the roles they play. Average blood volume they get and their functions change each day, among which the greatest changes occur on the day of season shifting. For each year in the Northern Hemisphere, spring for human body in the four seasons starts from the moment the sun reaches 315 degrees of celestial longitude. Every time the sun moves 90 degrees, next season begins. Average blood volume every organ and tissue get from internal body and their functions change in different seasons.

The Chinese culture may have recognized the seasons inside human body a long time ago. Although Chinese lunar calendar is based on the period of moon, the seasons Chinese lunar calendar takes are based on the seasons inside human body. Five thousand years ago, factors of seasons and days and nights inside human body are taken into consideration by traditional Chinese medicine in diagnosing and treating diseases. The seasons of other creatures with annual rhythm may be the same as that of human body.

The blood volume every organ and tissue get inside human body and functions change with time and inner seasons inside human body, which might be the internal causes for the occurrence of biological rhythm inside human body.

When people move on the earth, the human body system will detect the changes of longitude and make corresponding adjustments. The day and night shifting of human body will operate according to local solar time. When people move from the Northern Hemisphere to the Southern Hemisphere, the human body may detect the changes and make corresponding adjustments. The four seasons running of human body will be shifted for half a year. The spring inside human body will start from the moment the sun arrives at 135 degrees of celestial longitude.

Appendix B: Supplementary Instructions on Human Control System

For human body control system, the 12 subsystems in the left and right side of the body in total include 12 day-to-night blood supply models and 4 annual blood supply models. Each subsystem corresponds to one day-to-night blood supply model.

Each subsystem runs in accordance to the established procedure and corresponding day-to-night blood supply model and annual blood supply model will appear in the organ and tissue it controls. For example, day-to-night blood supply model for the respiratory organs runs as follow: blood volume human body system distributed to the respiratory organs from three o'clock to five o'clock in the morning is much more than that in other times, among which, blood volume summit comes at four in the morning. Blood volume human body system distributed gradually increases when it comes close to four in the morning and the blood volume human body distributed decreases gradually when the time goes far away from four in the morning. Annual blood supply model for the respiratory organs in the Northern Hemisphere comes as follow: average blood volume is maximal in autumn (starts when the sun arrives at 135 degrees of celestial longitude), minimal in spring (starts when the sun arrives at 315 degrees of celestial longitude) and intermediate in winter (starts when the sun arrives at 225 degrees of celestial longitude) and summer (starts when the sun arrives at 45 degrees of celestial longitude). Average blood volume peak during the day comes at the day when the sun travels to the 180 degree of celestial longitude and the average blood volume during the day is at its lowest when the sun arrives at the 360 degree of celestial longitude.

Blood in some organs or tissues inside human body is only controlled by one subsystem while others are controlled by two or more subsystems. If annual blood supply model of these subsystems varies, blood model of the organs or tissues controlled by two or more subsystems would be complicated.

When one subsystem goes wrong, the actual blood volume got by the organs or tissues controlled by this subsystem would be less than that distributed by human body system. Their functions will not meet system requirements and functions of these organs or tissues will not match functions of other organs or tissues. Mismatch degree changes with blood volume and time also. Function mismatch of these organs or tissues will lead to partial and overall abnormal operation of human body and finally result in all kinds of diseases (including infectious and non-infectious diseases), which is root causes of human diseases. Increase of blood volume received by organ or tissue during the year will enlarge mismatch degree and illness is easier to be caused on these organs or tissues and then the illness grows quicker,

leading to morbidity increase of these illness. Diseases morbidity and annual blood supply model of the subsystem are similar while morbidity summit would be relatively delayed in terms of time because it takes time for the disease to grow. In addition, the blood that doesn't reach to the organs or tissues will stay in arterial vessels and too high an amount of this part of blood will cause high blood pressure.

As human diseases are caused by the above reasons, disease-related phenomena are related to blood volume the ill part receives and blood volume change.

For example, if some organ or tissue is ill, disease symptoms will be more obvious as blood volume received by the organ or tissue and role it plays increases during the day. When blood volume is at its peak, disease symptoms are also at peak. Taking medicine with increased blood volume equals to taking more medicine. That's why medication efficacy will change along with time of taking medicine.

In another case, people react differently to one pathogenic factor during different times of the year[1]. The causes of infectious diseases include internal and external reasons. The internal causes is that blood volume organ or tissue receives changes with time and then the mismatch degree of functions of the disease-causing organ or tissue changes with time also. In terms of cold and in case of no quantity change in cold virus, when some parts of subsystem controlling blood in respiratory systems go wrong, average blood volume are maximal in autumn (starts when the sun arrives at 135 degrees of celestial longitude) in accordance to annual blood supply model of respiratory organs. Therefore, cold summit is supposed to be in autumn (starts when the sun arrives at 135 degrees of celestial longitude), but the cold air in frigid weather will enhance mismatch degree of functions of the cold-causing organ or tissue of the respiratory organs, making that the cold peak in shivery areas actually occurs in cold times.

As relationship between diseases and blood is clear, it's easier for us to figure out blood supply model of the ill part for some diseases from morbidity and symptom rhythm and finally to decide on the subsystems causing the diseases. If blood of the ill part is controlled by many subsystems with different annual blood supply models, the situation will be more complex.

For example, morbidity of breast cancer is highest in spring, lowest in autumn and intermediate in winter and summer[2]. Judging from this phenomenon, annual blood supply model for ill part of breast cancer shall be of maximal average blood volume in spring (starts

when the sun arrives at 315 degrees of celestial longitude), minimal average blood volume in autumn (starts when the sun arrives at 135 degrees of celestial longitude) and intermediate blood volume in winter and summer. Two subsystems of human body are of this annual blood supply model and day-to-night blood volume summit comes at two in the morning and midnight respectively. But it's unclear which one or all of the subsystems are wrong. However, if day-to-night peak value of breast cancer symptoms can be measured accurately, then the peak value must be at two in the morning or midnight or between the two times.

For another example, asthma would be intensified during night and peak value appears at four in the morning[2]. Judging from this, day-to-night blood supply model of the ill part of asthma is identical to that of respiratory organs. Therefore, it can be confirmed that asthma is caused by the misconduct of subsystem controlling blood in respiratory organs.