

Acute myocardial infarction (AMI) in context with the paradigm—month of birth and longevity

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ABSTRACT

Time and environmental physical activity are involved in timing of many medical events. In a recent study published by the National Academy of Science, USA it was shown that month of birth is related to longevity. The aim of this study was to check the month of birth distribution in a great group of AMI patients of both gender, one of the great killers in the developed countries, to check the mentioned paradigm of month of birth and longevity. **Methods & Patients:** Patients admitted to Cardiology Departments of a tertiary University Hospital in Kaunas, Lithuania with AMI at years 1990-2010 (n=22047) were studied. Month of birth of these patients, total and both gender were checked. Monthly, quarterly and trimester comparison were done. Statistical differences established using t-Student test and distribution by percents of the yearly months of birth. **Results:** It was a significant difference in the month of birth of the studied AMI population. January and first quarter and trimester born patients were more often in the studied AMI patients group. The higher morbidity by Cardiovascular diseases can be a significant ingredient in the structure of population longevity. Possible mechanisms explaining our findings are discussed. **Conclusion:** In the AMI population people born in January, first quarter or trimester of the year are dominating in both gender groups. The results of this study can be an additional confirmation of the paradigm about links between month of birth and longevity.

Keywords: Acute Myocardial Infarction; Month;

Birth; Men; Women; Solar; Geomagnetic; Cosmic Ray; Activity; Nutrition

1. INTRODUCTION

For a long time the yearly circle of the Earth's dynamics is divided in 12 parts of 30° named months. The first calendars are assumed to appear at 4241 BC [1-3].

In the ancient world some figures or animals were connected with time of the year, close to the Zodiac symbols classification. Specific yearly parting were done in Rome by Julius Caesar, Augustus and others, with Gregorian (Vatican), Christian Orthodox and Muslim and Jewish modification in their calendars. A yearly calendar exist in China and a number of Buddhist Cultures connected with some animals.

For a long time the individual human fate and its specificities were linked with the month of birth, or Zodiac sign (close to monthly separation) at the time of birth, a part of Astrology. Despite wide skepticism by many thinkers about such connection, many periodicals are regularly publishing Astrological data and predictions.

S. Hawking and “black hole” assumption as a physical beginning of time [4], the recent works showing the origin of Cosmic Ray (highest known form of energy in the Universe) with a close to our Galactic black hole radiation (2007) [5,6] space for time understanding. A special part of knowledge—Chronobiology is studying the time—biology, health interrelationship [7-9].

In the year 2001, the Academy of Science of the USA published a study in the Annals of the Academy about links between month of birth and longevity (inverse for each Hemisphere) [10].

Cardiovascular disease is one of the big killers in the developed countries (Industrial World) [11-13]. Some inequalities can exist in the monthly number of births

[14].

The aim of this study was to check if some monthly distribution exist in month of birth in patients suffering Acute Myocardial Infarction (AMI) total and each genders as an additional pretext for the paradigm of month of birth and longevity.

2. PATIENTS AND METHODS

23070 patients with AMI, admitted in the cardiology departments of tertiary hospital, Lithuanian University of Medical Sciences clinical base in Kaunas, Lithuania at years 1990-2010 were studied. The AMI diagnosis was made in accord to Guidelines using clinical, electrocardiography, echocardiography and laboratory tests [11-13]. At the beginning of the study it was established that 1023 patients registration data not included month of birth. These patients were excluded from the study and we remained with 22,047 patients, 13,415 male (60.84%) and 8632 female (39.16%). The monthly, quarter and trimester of birth of the AMI patients were compared and statistically significant differences between these time intervals established. Significance of 95% and higher between the compared parameters was accepted as significant. For comparison with concomitant space physical activity monthly data from centers in the USA, Russia, Finland was used [15-19].

3. RESULTS

Table 1 presents the AMI according to their month of birth. We can clearly see the differences of the monthly distribution with bulging beginning of the year. Born in January were the most frequent in total and each gender calculation. The average for male patients was 1117 ± 193.89 ; median 1107.5, for January 1584. Difference (467) more than two SD (387,78) above the average.

The same for female patients: January born-914. Average for all 12 months 719.3 ± 78.49 ; median-710. Difference between January and average of all 12 month 194.7, more than two SD (157.8) higher as the average.

Figure 1 presents the data separately for each gender. Here also the form of distribution remain as for the total group of patients.

Figure 2 presents the monthly birth distribution for five age groups: up to 55; 55 - 69; 70 - 84 and 85 and older. We can see that the analogical picture of monthly distribution seen in the previous table and picture 1 is repeated in all age groups.

Born in the first quarter, or trimester were more as in the following four or three parts of the year. ($P < 0.0001$). I- 2148.667 ± 305.16 ; II- 1891.667 ± 108.007 ; III- 1739.33 ± 70.87 ; IV- 1569.33 ± 71.009 average monthly by quarter of the year and I- 2084.75 ± 280.04 ; II- 1824.25 ± 128.08 ; III- 1602.75 ± 88.4 —by trimester.

Table 1. Monthly births of AMI patients, total and in 4 age groups Kaunas, Lithuania, 1990-2010.

Month of Birth	Up to 55	55 - 69	70 - 84	85 and more	Total	Percent
January	465	1141	764	128	2498	11,3
February	401	819	602	112	1934	8,8
March	425	851	639	99	2014	9,1
April	427	789	580	97	1893	8,6
May	439	884	568	108	1999	9,1
June	405	796	500	82	1783	8,1
July	390	792	554	85	1821	8,3
August	376	764	483	71	1694	7,7
September	356	721	553	73	1703	7,7
October	310	694	496	101	1601	7,3
November	304	615	495	74	1488	6,7
December	306	664	552	97	1619	7,3
Total	4604	9530	6786	1127	22047	100,0

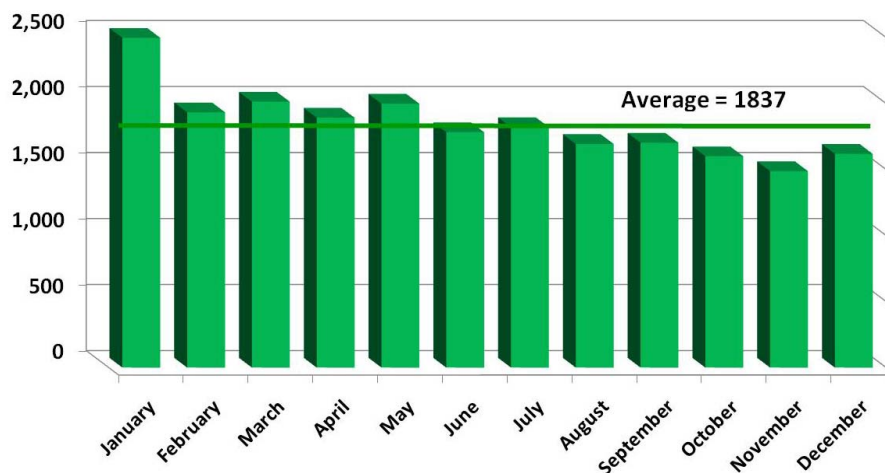


Figure 1. Monthly births of AMI patients (n-22047), Kaunas, Lithuania, 1990-2010.

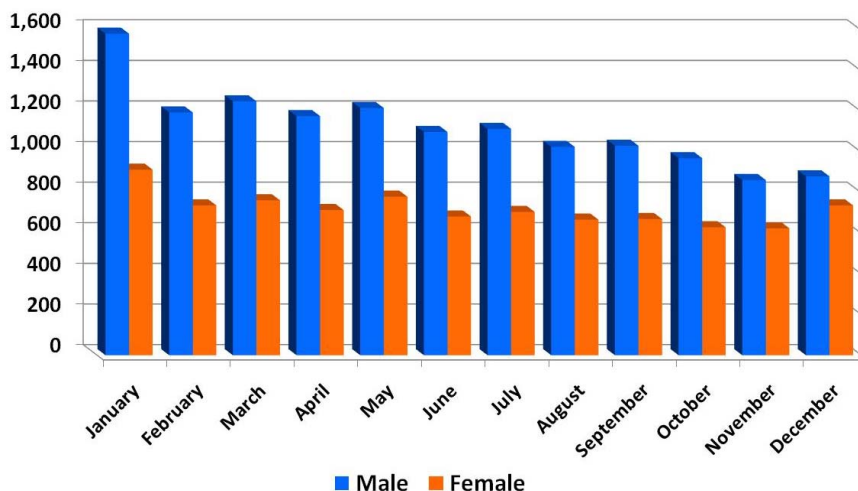


Figure 2. Monthly births of AMI patients both gender (n-22047), Kaunas, Lithuania, 1990-2010.

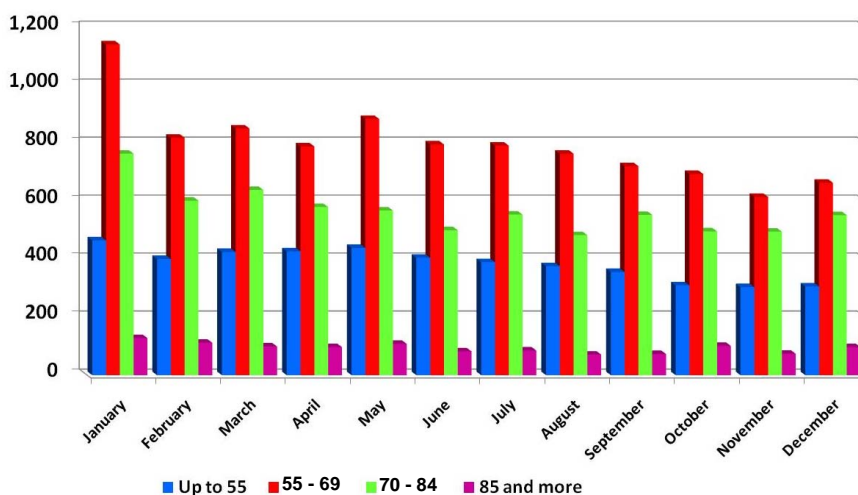


Figure 3. Monthly births of AMI patients (n-22047) in four age groups, Kaunas, Lithuania, 1990-2010.

4. DISCUSSION

This is our second attempt to check the monthly birth distribution of patients with acute cardiac events. The first was made on Israeli patients undergoing Percutaneous Coronary Intervention (PCI) for AMI. The study had some limitations:

Until 1950 people arriving to Israel (Palestine until 1948) were registered as born on January 1st. Of our 4732 patients 1154 were excluded from the study as born at January 1st. This was replaced by the average of births on January 2 - 31. Principally the result was similar—born in the first quarter—trimester were more, with special prominence in March [20].

In this study, in different geographic location, but in the Northern hemisphere, we get similar results.

What can be the explanation of the results?

1) It's assumed that predisposition to cardiovascular disease is in one quarter related to genetic factors [21,22], one quarter to factors affecting the fetus at pregnancy and a half—on environmental and day-to-day risk factors linked with lifestyle, working conditions, stress, nutrition [23], accompanying pathologies (Lipid profile, Diabetes mellitus, Renal failure, Hypothyroidism, etc.) [23]. Newborn weight is also connected with environmental physical conditions at the time of conception. So, birth weight was inverse correlated with Carotid artery intima thickness in middle age British men and woman [24].

2) Newborn weight and length are also connected with environmental physical conditions at the time of conception [24,25] are also signs predicting obesity, hypertension and coronary problems in the future and serving

as risk factors for coronary artery disease in middle age [25].

3) Such physical factors like Time, Solar, Geomagnetic, Cosmic Ray (Neutron) activity are connected with timing of distribution such pathologies like Down Syndrome [26], Congenital Heart Disease [27,28] some forms of congenital failures [29], Cystic fibrosis [30] etc.

4) Solar and Geomagnetic fields are inverse related and serving natural shields against Cosmic Ray (highest known energies) (Neutron activity at the Earth surface in imp/min counted) damaging effects on our Planet, but at very high levels SA and GMA are also connected with many human pathologies [30-35].

5) In a study about monthly number of newborns (n=286,963) in the same as this study area it was not found significant relationship between month of birth and newborns number, that would explain major shifts in the population according to month of birth and possibility to be affected by a popular disease [36]. No significant relationship in the number of monthly newborns and yearly months 1 - 12 was found ($r = -0.0039$, $p = 0.7$, for male, $n = 148089$; $r = 0.03997$, $p = 0.699$ for female, $n = 138,830$; 96 months data).

6) It's shown that Cosmic Ray activity is inverse related to the SA 11-year cycle, but, relatively, not strong variation from month to month [34,36,37].

The sun itself—a source of wave and corpuscular effects on the Earth is significantly changing monthly, and not only yearly. The distance of the Sun is maximal at July 4, minimal at January 3rd. Difference more than 5,000,000 km. Space corpuscular activity can change human enzymes activity—a key mechanism in many bioeffective structure synthesis in human body, including mechanisms involved in Atherosclerosis risk and dynamics [38-40].

7) In addition to the reported in PNAS data about month of birth (10) and longevity opposite results in the two hemispheres of our Planet, it was published by a group of experimental and laboratory scientists that similar observations are made in rats [41,42].

Their findings the authors connect with differences in Melatonin synthesis in rats at different months of the year. Some role of the Geomagnetic and Solar cycle effects are also presumed.

The differences in Solar light intensity and Melatonin production dependence by dark-light interplay can explain the differences in the hemispheres. Some observation are made on Serotonin (Melatonin precursor) cardiovascular effects [43].

But this demands additional studies for explaining the observed month of birth—AMI interrelationship and possible influence on human longevity

5. CONCLUSIONS

1) Acute Myocardial Infarction patients are unequal distributed by month of birth. In the Northern Hemisphere they show a significant maximal January, first quarter and trimester prevalence in comparison with following months quarters and trimesters of the year.

This was seen in patients of both gender.

2) The findings in the AMI cohort can be a supporting fragment for the paradigm birth month and longevity.

3) Genetic, social and environmental factors can be involved in the predisposition for coronary atherosclerosis in persons born at the beginning of the year in the Northern Hemisphere.

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