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Cardiovascular and Medical Energency Emergency Events and Sudden Cardiac Death (SCD)on Days (n-34)of Zero Geomagnetic Activity (GMA), 2002-2007

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Geospace is sensitive to solar activity (SA), to changes in this activity and its manifestations on Earth and its surrounding. It is widely accepted that the Sun-Earth interaction processes and related space weather changes influence ground-based and space-borne technologies and pose a health and safety threat to living beings and all kinds of human activities. The geomagnetic field which protects the Earth mainly from solar wind and cosmic rays is also essential to the evolution of life. Investigations show that when the geomagnetic environment is disturbed, it can have either direct or indirect effect on human physiology and health when the magnitude of the factor is quite small. Recent studies show for many medical-biological parameters, inverse links with GMA. The aim of this study was to study dynamics of medical events not only at extremely low GMA levels, bust also at zero geomagnetic conditions, namely to check the number of medical events and specific death number trends at days of - daily zero- GMA. Patients & methods:. Daily data were created on the basis of data from Grand Baku Area (Azerbaijan, 3.0 mln. population) in accordance to the WHO standards for the period 01.12.2002-31.12.2007. 1567576 emergency calls and 46350 deaths, 10054 cerebral strokes (CVA), 7817 AMI, 1608 SCD were analyzed. In addition to cardiology data trauma (n-54654) and infections (n-18838) were also included in the study on 1837 consecutive days. According to daily GMA indices K=0 were at 34 days, 1823 days-K>0. Also daily cosmic ray activity (CRA) was studied as a parameter antagonistic to Solar and GMA. CRA was presented by Neutron activity on the Earth surface in imp/min. Space weather data were handled from the USA, Russian and Finland space science centers. Results: The number of all emergencies (n=1567576, p<0.0001)), all deaths (n=46350, p=0.0076) were significantly revealed at days of zero level of GMA. Absolutely more (+5.0%) deaths from acute myocardial infarction (AMI), cerebral stroke (CS) (+14.28%), sudden cardiac death (SCD) (+17.08%), trauma (+4.0%) were registered at geomagnetical zero days. Meanwhile only for CS (n=10054)) and SCD (n=1615) there was achieved a strong trend level. For MACE (AMI,CVA,SCD) the difference was p=0.058. The neutron activity on Earth's surface was significantly higher (p<0.0001) at days of "0" GMA. Deaths from infections showed an inverse relation (-6.3%). For achieving the statistical significance for CS and SCD such days' number must be approximately three times higher (99-100). ˙onclusion: on days of zero GMA and high CRA-neutron activity the number of cardiovascular emergencies and deaths show a trend to raise, compared to days with higher GMA. Between compared pathologies, SCD and CVA-related deaths are most prominent ones.