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RESEARCH ARTICLE

LUNAR CYCLE AFFECTING SUICIDAL DEATH IN VARANASI REGION: A REALITY OR MYTH

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ABSTRACT

The effect of lunar cycle on human behavior has always been the area of interest for the researchers worldwide. It is accepted in academic literature as 'The Transylvanian Effect'. While some has drawn results in favor of this, some also has rejected this hypothesis on the basis of negative results. This study aims to find out the effect of lunar cycle on suicidal deaths. This prospective study is done over a period of 18 and half months (1st January 2013 to 17th July 2014). During this period, a total of 152 cases were taken in this study which include unnatural death by suicide. These cases were brought to the Department of Forensic Medicine, IMS, BHU, Varanasi for medico legal postmortem examination from the various police station of Varanasi and have been analyzed prospectively. The incidences of suicidal deaths in and around full moon and new moon days were compared with that of other days of the month which are statically analyzed by employing the 'one-way parametric ANOVA'. The study reveals a rise in incidences during the full moon and new moon days over the others but is statistically insignificant. It is concluded that there is no correlation between lunar cycle and occurrence of suicidal deaths.

INTRODUCTION

The Moon has a long association with insanity and irrationality; the words *lunacy* and *lunatic* (popular shortening *loony*) are derived from the Latin name for the Moon, *Luna*. The possible influence of the lunar cycle on human psychology and physiology is the phenomenon now known as 'The Transylvanian Effect' in academic literature (**Mason, 1997**). Tales about monsters, werewolves, and vampires raised by the full moon to pursue their evil deeds is still a very common belief in India and other parts of the world. Even very educated people blame the moon for sleepless nights and bad behavior of their children. The mystery of moon attracted studies worldwide on different variables. This includes its effect on onset of labor (**Capt Andrea ,1989**), crime (**Thakur and Sharma, 1984; Jay Karan *et al.*, 2010; Schafer, Joseph *et al.*, 2010**), suicide rate (**Gutierrez-Garcıa and F. Tusell 1997**), psychopathologies (**Barr, 2000**), survival after surgery in lung cancer (**Kuehnl *et al.*, 2009**), serum ion fluctuations (**Ayyoub Malek *et al.*, 2010**), stock market fluctuations (**Timothy Falcon Crack, 1999**), alcoholism, madness, epilepsy, sleepwalking, homicide, and arson. **Lieber (1978)** stated that, "Belief in the power of the moon to influence human behavior is not a superstitious practice of silly people. It is the formed opinion of experienced professionals who work with the public" (**Lieber, 1978**). There have been many studies that show no significance between the full moon and behavior. Most people accepted the results of no significance and causes of mere superstition, but some come to the defense based on their own casual observations.

A study shows that the hypothesis of a relationship between the moon's phases and human behavior is not supported by the evidence of a large number of studies conducted by many independent investigators all over the world (**Mark Owens and Iain W. McGowan, 2006**). In spite of that we want to test again for the lunar influence on suicidal deaths. Our study differs from previous works in two aspects, inclusion of new moon days, and focusing on dates adjacent (2 days before and after) to full moon and new moon days as well.

MATERIALS AND METHODS

The present study is carried out at department of Forensic Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi. Cases for the present study were selected from the dead bodies brought into the mortuary of the Department of Forensic Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi, for medico legal postmortem examination from the various police station of Varanasi. This prospective study is done over a period of 18 and half months (1st January 2013 to 17th July 2014).

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During this period, a total of 152 cases were taken in this study which include unnatural death by suicide. The data of the materials were filled in the scheduled proforma sheet. The history as regards the circumstances of the suicidal death and other relevant data about the cases were collected from the following sources

(1) The papers sent by police for medico legal autopsy:
   (a) Inquest report,
   (b) Copy of the first information report (F.I.R.),
   (c) Death certificate if hospital death is there,
   (d) Suicidal notes/other relevant reports etc.
   (e) Hospital records/reports if available etc.
(2) From the interrogation of the concerned personnel –
   (a) Police constables accompanying the dead bodies, and
   (b) Attendants/relatives, friends and others of the victim.
(3) Postmortem examination of the dead bodies.

Those data were then compiled together and were studied and statically analyzed by employing the 'one-way parametric ANOVA'.

RESULTS

The outcome of the overall observations and analysis of results of 152 suicide cases has been included in the present study. A total of 19 events of 'full moon' and 'new moon' each occurred over the period of 18 and half months of the study. The rate of incidence on:

1. Full moon days
2. New/ No moon days
3. Rest of the days (i.e. excluding 1 and 2) of suicidal deaths been compared with each other.

Table 1. Analysis of Variance (ANOVA) results with regard to Suicidal deaths and lunar cycle

Lunar Cycle	Total no. of days	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Full moon days	38	6.39	2.785	.452	5.48	7.31
Rest of days	136	6.12	2.377	.204	5.72	6.53
New moon days	45	5.93	2.571	.383	5.16	6.71
Total	219	6.13	2.484	.168	5.80	6.46

F value=0.355 P value=0.702

Table 1 indicates the rate of incidence of unnatural deaths by suicide over the different phases of the lunar cycle. It is observed that the rate during the full moon period (mean value=6.39) is higher than that of new moon days (mean value=5.93), rest of the days (mean value=6.12) and the overall rate (mean value=6.13) as well. But the rise in incidences during the full moon days over the others is statistically insignificant as indicated by the P value (0.702).

DISCUSSION

To start with the hypothesis, the incidence of unnatural death increases in and around full moon days or new moon days or both. To prove this hypothesis, we compared the 'mean' of suicidal deaths with respect to lunar cycle in the different natures of the death separately and it is found that there is a rise in mean incidence of suicidal deaths in the full moon period over new moon period and also rest of the days. The study shows that this rise in mean value with respect to lunar cycle hasn't got any statistical significance. **Gutierrez-Garcıa and Tusell in 1997** studied a total of 897 suicide deaths reported by the Anatomical Forensic Institute of Madrid. They concluded that: there appears to be no relationship between lunar phases and suicide (**Gutierrez-Garcıa and Tusell, 1997**). **Oderda and Klein-Schwartz (1983)** found that suicide attempts and drug abuse occurred most frequently during the new moon period (**Oderda and Klein-Schwartz, 1983**). **Moosa Zargar *et al*** in their study in three different hospitals of Tehran in 2004 found that there is no association between assault and attempted suicide around the full moon days (**Moosa zargar *et al.*, 2004). Tejedor *et al.* in 2010** reported no association between moon phases and characteristics of psychiatric emergencies. The only empirical relationship of the moon phases with psychiatric behavior of the mentally ill in their sample was manifested as an increase in the incidence of cases and greater disruption of sleep patterns (**Tejedor *et al.*, 2010**).

Teresa Biermann *et al.* in 2009 reported that no significant associations between full, absent, and the moon's interphases and serious crimes of battery could be detected. Furthermore, a Fourier analysis was conducted that failed to produce an association between violence and the moon's phases (**Teresa Biermann *et al.*, 2009**). It has been postulated that this change of behavior may be attributed to 'Human Tidal Waves' because of gravitational pull of moon (**Thakur and Sharma, 1984; Jay Karan *et al.*, 2010**). Others assumed that one probable mechanism is fluctuations in body fluid levels congruent with moon phases, and therefore the serum sodium and lithium levels in male rabbits in different moon phases were evaluated (**Ayyoub Malek *et al.*, 2010**). Some studies do support that there are changes in human physiology and psychology with relation to lunar cycle (**Thakur and Sharma, 1984; Ayyoub Malek *et al.*, 2010; Timothy Falcon Crack, 1999**) but others (**Capt Andrea R. Neuerburg, 1989; Jay Karan *et al.*, 2010; Schafer *et al.*, 2010; Gutierrez-Garcıa and F. Tusell, 1997; Barr, 2000; Kuehnl, 2009**) didn't find any association. A study shows that most of the study which tested the lunar influence on human behavior did not find any association (**Mark Owens and Iain W. McGowan, 2006**). This negative result is consistent with our study as well.

Although our study is negative, an elaborate study with larger sample and longer duration is required to confirm this hypothesis. The pitfall in this work may be the number of cases that came (152 only) during the total duration of this study. Also, we were not able to include the cases of attempted suicides. In this study, we took new moon days in consideration along with full moon days which is not the case with many other studies. Also we took two days back and forth of new moon and full moon days which is again strength of our study.

So on the basis of this study; we conclude that there is no correlation between lunar cycle and suicidal deaths.

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Conflict of Interest

Nil

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Ethical clearance

The present study was approved by "Institutional Ethical Committee" of Institute of Medical Sciences, Banaras Hindu University, Varanasi. All the information has been taken under consideration of medical ethical committee.

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