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Commentary: "Here's one I prepared earlier"

Nigel F Hall

At first glance, Roger Armour's instructions for making a direct ophthalmoscope seem to have more in common with one of the model building exercises so beloved of the BBC children's television programme *Blue Peter* than they do with the pages of a scientific journal. Nevertheless, I built an instrument according to his design, and with it I saw the optic discs of my 8 year old daughter in sharp focus.

Despite their appearance and cost, commercially available direct ophthalmoscopes are fundamentally simple. In essence, the instrument's light beam is directed by a mirror along the visual axis between subject and observer. The focusing power of the subject's eye is then used as a magnifying lens, enabling the observer to view the retina at close quarters.[1]

Medical students are expected to become competent at fundus examination with a direct ophthalmoscope, but most don't have their own instrument because of its high cost.[2] To acquire the skill of ophthalmoscopy requires practice. Practice comes with opportunity, and opportunity, I would suggest, comes with ownership of an instrument. At a cost of 75p, Mr Armour's ophthalmoscope is a Christmas cracker.

The challenge now is for an ophthalmologist to come up with a home made sigmoidoscope.

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Do animals bite more during a full moon? Retrospective observational analysis

Chanchal Bhattacharjee, Peter Bradley, Matt Smith, Andrew J Scally, Bradley J Wilson

Abstract

Objective To test the hypothesis that the incidence of animal bites increases at the time of a full moon.
Design Retrospective observational analysis.
Setting Accident and emergency department at a general hospital in an English city.
Subjects 1621 consecutive patients, irrespective of age and sex.
Main outcome measures Number of patients who attended an accident and emergency department during 1997 to 1999 after being bitten by an animal. The number of bites in each day was compared with the lunar phase in each month.
Results The incidence of animal bites rose significantly at the time of a full moon. With the period of the full moon as the reference period, the incidence rate ratio of the bites for all other periods of the lunar cycle was significantly lower ($P < 0.001$).
Conclusions The full moon is associated with a significant increase in animal bites to humans.

Introduction

The word "lunacy" is derived from Luna, the Roman goddess of the moon, and from the belief that the power of the moon can cause disorders of the mind.[1] The effect of the phases of the moon on human nature and behaviour is well documented; some studies show positive aspects of the association and some show negative aspects. Crime, crisis incidence, human aggression, human births, and traffic accidents are all positively correlated with the phases of the moon.[2–6] Some articles have suggested that the full moon has no influence on human insanity, alcohol intake, drug overdose, trauma, or the volume of patients in emergency departments.[7–11]

We are not aware, however, of any correlation between the full moon and injury to humans by animals. In ancient mythology the day of the full moon was a day for driving away misfortune and evil. We aimed to determine if any pattern exists of animal attacks on humans during a full moon.

Materials and methods

We collected data on new patients attending the accident and emergency department at Bradford Royal Infirmary during 1997 to 1999 after being bitten by an animal; the data came from the department's computer database, which records information on all new admissions.

We calculated the total number of patients in each calendar month and then distributed this number according to the days of the lunar months. We then compared the total numbers of patients on each day of

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A table showing the data supporting figure 2 is available on the BMJ's website

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Number of bites among new patients attending accident and emergency department, according to 10 periods of the lunar cycle

	1	2	3	4	5	6	7	8	9	10
Lunar days	16, 17, 18	19, 20, 21	22, 23, 24	25, 26, 27	28, full moon, 1	2, 3, 4	5, 6, 7	8, 9, 10	11, 12, 13	14, 15
No of bites	137	150	163	201	269	155	142	146	148	110

each lunar month. All human and insect bites were excluded from our study.

According to the definition of a full moon (the middle day in the 29.531-day lunar cycle) (see also box), we divided the lunar month into 10 periods, with the first nine periods having three days and the last one having two (see table). The model we used in our statistical analysis accommodated this difference in days.

Data were then analysed by using Stata (release 6.0) software (Stata Corporation, College Station, Texas, USA). We used a Poisson log linear model, with period of the moon as a categorical independent variable, and modelled the number of bites on this single factor. Cumulative incidence (number of patients reporting bites) for the 10 periods and also for each lunar day, was then analysed. Significance was set at a P value of <0.05.

Results

There were 37 full moon days and one blue moon day (see box) from 1 January 1997 to 31 December 1999. In all, 1621 new patients had been bitten by animals (56 cat bites (3.4%), 11 rat bites (0.7%), 13 horse bites (0.8%), and 1541 dog bites (95.1%)). The highest numbers of bites were on or around full moon days (table and fig 1).

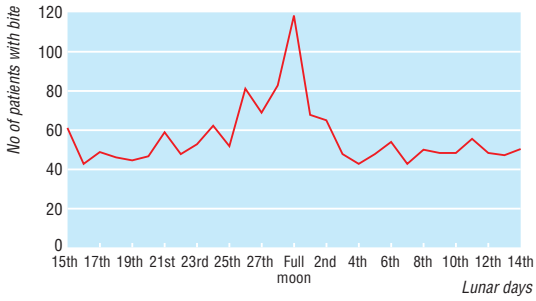

Fig 1 Number of animal bites according to day of lunar month

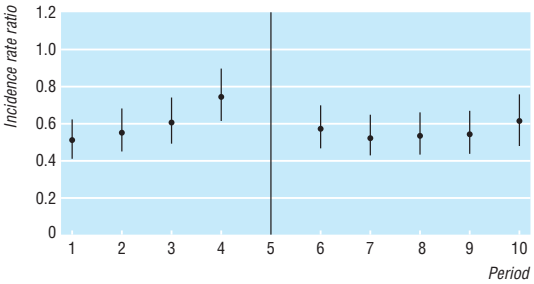

Fig 2 Incidence rate ratios and 95% confidence intervals of number of animal bites relative to number occurring at full moon

The incidence of animal bites in period 5 (time of full moon) was significantly higher than the incidence in the other periods in the lunar cycle ($P<0.001$; $P=0.002$ for period 4) (fig 2). When we excluded period 5, the incidence of bites in period 4 was also significantly higher than the incidence in all other periods except period 10. The rise in incidence seemed to accelerate therefore a few days before a full moon, peaking sharply on the day of the full moon before falling away rapidly to rate that was about half the rate at full moon.

Discussion

In our study we showed that an association exists between the lunar cycles and changes in animal behaviour and that animals' propensity to bite humans accelerates sharply at the time of a full moon. Further experiments are needed to verify our hypothesis. Few other studies have correlated the influence of the full moon with behaviour of animals or insects. One article has suggested that the predatory activity of mites is significantly depressed during a full moon.[12]

The moon, ever present, will continue to influence different aspects of nature and humans. More studies are therefore needed to explore lunar effects on animals, especially their propensity to bite humans.

We thank Rita Stocks, assistant manager in the patient administration department at the Bradford Royal Infirmary, for providing valuable data from the computer.

Lunar definitions

Full moon
The phase of the moon in which it is fully illuminated as seen from the earth. It is defined as three day periods in the 29.531-day lunar cycle, with the middle day generally described as the day of the full moon.

Lunation
The time between two successive new moons. This varies, but the approximate time is 29.530589 days (synodic period of the moon).

New moon
The phase of the moon when it is first visible as seen from the earth.

Blue moon
Sometimes a full moon will occur twice in a month. The second full moon in that month is called a blue moon.

What is already known on this topic

Human behaviour is altered during the full moon period

No study has significantly correlated the effects of a full moon with the propensity of animals to bite

What this study adds

Animals have an increased propensity to bite humans during the full moon periods

Contributors: CB, the principal investigator, initiated the study; collected data; documented and designed the study; drafted the hypothesis; and wrote the paper. PB had the original idea for the hypothesis and coordinated the study. MS, the principal motivator of the study, participated in designing and editing the paper. AJS performed all the statistical analysis of the data and created the graphs. BJW helped to collect data and tried to correlate the changes in animal behaviour with the changes in nature.

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Barking mad? Another lunatic hypothesis bites the dust

Simon Chapman, Stephen Morrell

Abstract

Objective To assess whether dog bites requiring hospital admission occur more at the full moon.
Design Review of dates of admission for dog bites to accident and emergency departments, June 1997 to June 1998, compared with dates of the full moon.
Setting All public hospitals in Australia.
Main outcome measures Admissions for dog bites.
Results 12 peak clusters of admissions were unrelated to the time of the full moon.
Conclusion Dog bites are no more frequent on full moons than at any other time of the month. Sceptics rejoice.

Introduction

After publicity about the paper (by SC) on a randomised controlled trial to reduce dog bites,[1] we were contacted by a farmer who asked: "Have you university types ever looked at whether dog bites happen more around the full moon? It's a well known fact that they do." Farmers are often storehouses of folkloric knowledge said to be derived from a rich tradition of empirical observation of, for example, sky colour and the weather ("red sky at night, shepherd's delight; red sky in the morning, shepherd's warning") or avoiding the wrath of bulls ("red rag to a bull")—so we leashed our scepticism and investigated.

The influence of the full moon remains one of the more resilient popular explanations of a wide range of mostly traumatic or bizarre events. There is a pale reflection of this in epidemiology—recall bias—where those affected by a rare or severe disease are more inclined to associate unrelated non-disease exposures to the disease. Although more women have been documented to menstruate around the full moon,[2] research has generally failed to confirm any association between the full moon and the manifestation of psychiatric disorders or violence in psychiatric settings,[3 4] consultations for anxiety or depression in general practice,[5] suicide and self poisoning,[6 7] agitation among nursing home residents,[8] car accidents,[9] major trauma,[10] or emergency department admissions.[11]

Weak associations have been reported between the full moon and the distribution of spontaneous full term deliveries,[12] small increases in meal size and reduced alcohol consumption,[13] unintentional poisonings,[14] absenteeism,[15] aggression in Dade County, Florida,[16] and reports of crimes to three police stations in India between 1978 and 1982. The latter, in a nation devoted to astrology, was posited by the authors to be caused by "human tidal waves" caused by the gravitational pull of the moon.[17]

So it seems that humans are mostly impervious to putative effects of the full moon on mental health and behaviour. But what about our best friend, Phideau? Do howling dogs feel more inclined to bite humans during the full moon than at other times? Or are their barks worse than their bites when a human interrupts their canine arias? Such questions have dogged science for so long that they can no longer be ignawed.

Methods

We obtained from the National Injury Surveillance Unit 12 months of data on daily admissions for dog bites to all accident and emergency departments in public hospitals in Australia. We chose a year of data for analysis that would supply sufficient event numbers, both of dog bites and full moons, and would enable us to sniff out any seasonal variation in dog bite admissions. Age and sex of victims, but not perpetrators, were available. Daily admissions for 13 June 1997 to 12 June 1998 were plotted against the occurrence of a full moon. Mean daily admission numbers were analysed in relation to the presence or absence of a full moon, stratified by day of the week so that comparisons between full moon and non-full moon days were for the equivalent day of the week. Mean dog bite admissions during full moons occurring on, for example, a Monday were compared with dog bite admissions for all other Mondays.

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