

Canine and feline emergency room visits and the lunar cycle: 11,940 cases (1992–2002)

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Objective—To determine the frequency of canine and feline emergency visits with respect to the lunar cycle.

Design—Retrospective case series.

Animals—11,940 dogs and cats evaluated on an emergency basis during an 11-year period.

Procedures—Date of emergency visit, signalment, and chief complaint were retrieved from a medical records database. Emergency type was categorized as animal bite, cardiac arrest, epilepsy, ophthalmic, gastric dilatation-volvulus, trauma, multiple diseases, neoplasia, or toxicosis. The corresponding lunar phase was calculated and recorded as new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, last quarter, or waning crescent. The effect of lunar phase on the frequency of emergency visits was evaluated by calculating relative risk.

Results—Of 11,940 cases, 9,407 were canine and 2,533 were feline. Relative risk calculations identified a significant increase in emergencies for dogs and cats on fuller moon days (waxing gibbous to waning gibbous), compared with all other days.

Conclusions and Clinical Relevance—Results suggested that more emergency room visits occurred on fuller moon days for dogs and cats. It is unlikely that an attending clinician would notice the fractional increase in visits (0.59 and 0.13 more canine and feline visits, respectively) observed in this study at a facility with a low caseload. If the study is repeated at a facility with a robust emergency caseload, these results may lead to reorganization of staffing on fuller moon dates. A prospective study evaluating these findings under conditions of high caseload is necessary to determine the clinical relevance. (*J Am Vet Med Assoc* 2007;231:251–253)

The lunar cycle has long been credited with influencing various medical conditions. The term lunacy is derived from the root word Luna, the Roman goddess of the moon, and from the belief that the power of the moon can influence the human mind.¹ A literature search failed to find any studies evaluating possible relationships of the lunar phase and case evaluations in veterinary medicine. Although scientific evidence is lacking, many veterinarians and emergency room staff members believe that moon phases influence caseload.

Many studies investigating the effect of the moon on human nature, behavior, and various medical problems have been published, with evidence both supporting and refuting an effect. The incidence of psychologic crisis, suicide, gout attack, human parturition, dog bites, and psychogenic nonepileptic seizures have all been positively correlated with the full moon.^{1,2} Conversely, lack of correlations between a full moon and cardiopulmonary arrest frequency, oral and maxillofacial emergency cases, dog bites, epileptic seizures, victims of aggression, emergency room visits, and the incidence of major trauma have also been reported in the human literature.²⁻⁸

The lunar cycle is characterized by periodic variation in the illuminated surface of the moon that is visible from the earth. One complete lunar cycle is 29.5 days. The 8 phases of the lunar cycle are the new moon, the waxing crescent, the first quarter, the waxing gibbous, the full moon, the waning gibbous, the third quarter, and the waning crescent moon (Figure 1). These phases correspond to the amount

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ABBREVIATION
CSU VMC Colorado State University Veterinary Medical Center









Phase	Illustration
New	
Waxing crescent	
First quarter	
Waxing gibbous	
Full	
Waning gibbous	
Third quarter	
Waning crescent	

Figure 1—Illustration of the lunar phases.

of lunar surface reflecting available light visible from the earth. A full moon occurs when the sun, earth, and moon are aligned; the night of the full moon provides the most available moonlight during the lunar cycle.⁸

The objective of the study reported here was to evaluate the frequency and type of canine and feline emergency visits at the CSU VMC emergency service during an 11-year period and examine their association with the lunar cycle. We hypothesized that the number of emergency evaluations would not increase on the day of, nor on the 12 days surrounding, the full moon.

Criteria for Selection of Cases

Records of 11,949 dogs and cats evaluated serially at the CSU VMC emergency service from February 2, 1992, to December 31, 2002, and for which a master problem list was generated were evaluated.

Procedures

Information from the master problem list, as provided by the primary clinician, was collected. These data were separated by type of emergency into broad groups of animal bite, cardiac arrest, seizure, ophthalmic, gastric dilatation-volvulus, trauma, toxicosis, neoplasia, and multiple diseases. The phase of the moon corresponding to each date of evaluation was calculated from a Web site and entered as one of the following groups: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter, or waning crescent.^{9,a}

Statistical analysis—Canine and feline cases were evaluated separately. The percentage of admissions by lunar phase on a daily basis were calculated as follows: (No. of observed emergencies in the lunar phase)/(Total No. of emergencies \times No. of days in lunar phase) \times 100%. For example, of the 2,533 total feline emergencies, 559 (3.68%) emergencies occurred during the waxing crescent phase, which includes 6 days. Logistic regression, assuming a Poisson distribution, was used to evaluate differences in the number of emergencies per day among the lunar phases.^b The number of full moon emergencies per day was compared with the number of emergencies per day pooled across all other lunar phases. Additionally, fuller moon emergencies (defined as those occurring during waxing gibbous, full moon, and waning gibbous phases) were compared with emergencies pooled across all other lunar phases. For all comparisons, $P < 0.05$ was considered significant.

Results

Of 11,940 cases that met the inclusion criteria, 9,407 were canine and 2,533 were feline. In the 11-year study period, there were 4,017 days. The frequency of canine

and feline emergency visits during the 8 lunar phases was determined (Figures 2 and 3). The number of daily emergencies on full moon days was not significantly different from non-full moon days for either cats (0.69 vs 0.63 emergencies/d, respectively) or dogs (2.37 vs 2.34 emergencies/d, respectively). There were significant differences in the number of emergencies observed on fuller moon days, compared with other days. There was a mean of 0.71 emergencies/d on fuller moon days and 0.58 emergencies/d on other days in cats (relative risk, 1.23; 95% confidence interval, 1.13 to 1.33; $P < 0.001$). In dogs, a mean of 2.68 emergencies/d on fuller moon days and 2.09 emergencies/d on other days was observed (relative risk, 1.28; 95% confidence interval, 1.23 to 1.34; $P < 0.001$). Thus, the risk of emergencies on fuller moon days, compared with other days, was 23% greater in cats and 28% greater in dogs. The type of emergency was not associated with the full moon in either dogs or cats.

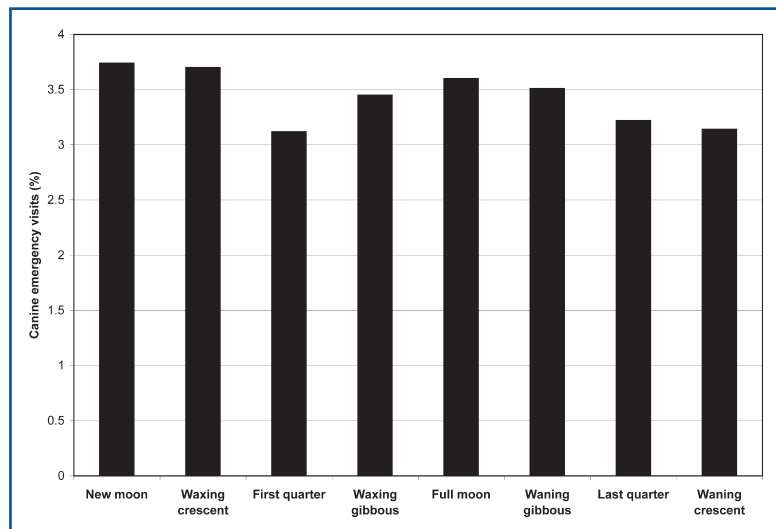


Figure 2—Canine admissions (%) to the CSU VMC emergency service during various lunar phases from February 2, 1992, to December 31, 2002.

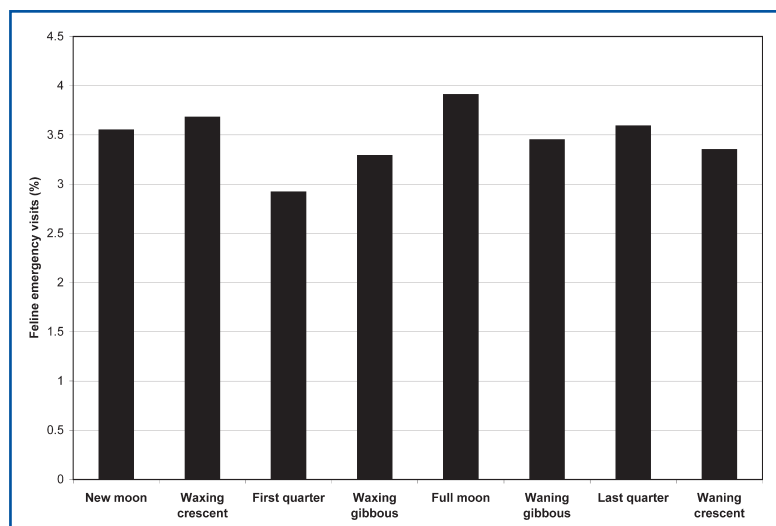


Figure 3—Feline admissions (%) to the CSU VMC emergency service during various lunar phases from February 2, 1992, to December 31, 2002.

Discussion

The belief that the moon exerts an influence on different aspects of animal and human physiologic variables and behavior has been stated in several medical studies.^{1,6,8} Evidence for the underlying mechanism for this phenomenon is lacking. It is possible that factors such as the photoperiodicity of the moon cycle on circadian rhythms, the gravitational force of the moon, or both play a role.^{6,8} Some scientists believe that the gravitational effects of the lunar phases on animals are negligible.⁶

In the present study, the days were grouped according to photoperiodicity of the moon cycle. The 12 days surrounding the full moon were grouped together to assess any possible association between the greater available moonlight and the frequency of emergency room visits.

Results of this study suggested that more emergency room visits occurred on fuller moon days for both dogs and cats. Although anticipating demand for staff is an ongoing concern in emergency medicine, it seems unlikely that an attending clinician would notice 0.59 and 0.13 more canine and feline visits, respectively, on fuller moon days at a facility with a low caseload. These results may have greater clinical relevance for staffing concerns at facilities with large emergency service caseloads. Although results of this study will not lead to reorganization of the emergency room at the CSU VMC, similar findings at a busier emergency room may warrant a larger staff on fuller moon days.

A potential explanation for the increased number of cases on days of the fuller moon is increased lunar luminosity. Cats and dogs may have more nocturnal activity during the fuller moon phase, leading to a higher likelihood of injury. Following this logic, we would expect more feline trauma cases on these nights. This was not evident. Although it could be argued that better visibility on fuller moon nights would lower the risk of automobile-induced injury, no difference in the number of automobile-associated visits was detected. The emergency room at CSU is located in a mostly urban setting with modern lighting, which would also make this theory less tenable.

The retrospective design of this study had inherent limitations, including clinician variability and inability to assess any role the hour of day had on visits in as-

sociation with lunar cycle. Although it was not possible to control for the role of the human psyche because veterinary patients are presented by human caregivers, most of the disease categories were conditions in which indications for evaluation are fairly independent of subjective influence. In addition, the lack of a significant difference in visit frequency across unambiguous groups (eg, automobile trauma and gastric dilatation-volvulus) and groups more susceptible to subjective influence (eg, multiple disease and possible toxicosis) suggested that the association with lunar cycle was not associated with subjective human influences. A prospective study assessing time of day and season of emergency visit, ownership status of the animal, and circumstances of the injury (eg, roaming) in addition to other study criteria, preferably at 1 or more institutions with higher caseloads, is warranted to determine the clinical relevance of these findings. In addition, evaluation of large animal emergency visits might also provide insight into the associations with the lunar cycle and mechanisms of action.

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 - b. SAS, version 8, SAS Institute Inc, Cary, NC.
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