

Gout attacks and lunar cycle

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Summary The aim was to search for periodical fluctuations in daily occurrence of gout attacks during the synodic lunar cycle. 126 gout attacks were recorded between 1972 and 1994 at known calendar dates. The synodic plexogram, displaying the number of attacks for each day of the cycle, was processed by cosinor regression. A pronounced cycling was found, with highest peaks under the new and full moon (syzygies). Thus, the maximal occurrence of attacks coincides with the peaking lunisolar tidal effect. Similar relation of attacks to synodic moon was seen in bronchial asthma of children, and a reciprocal one in paroxysmal tachyarrhythmia. Differing pathogenetic backgrounds of these diseases substantiate the observed differences in their putative reactions on the changing cosmogeophysical environment. © 2000 Harcourt Publishers Ltd

INTRODUCTION

The pathogenic material in gout – sodium urate monohydrate – is produced in connection with various, usually well known conditions of the inner and outer environment. It circulates in tissue fluids of the whole body and penetrates into joints and other structures, where it forms crystals and causes acute inflammation and pain.

The aim of the present contribution was to compare the time distribution of the attacks during more than two decades, with the phases of the synodic lunar cycle.

PATIENTS AND METHODS

The calendar dates of 126 gout attacks¹ recorded from February 15 1972 to June 2 1994, i.e. during 8144 days, were obtained from 55 patients. Of them, 52 were male (95% confidence interval 85–99%) and three female (95% confidence interval 1–15%). The distance between both intervals testifies to the statistically significant ($\alpha = 0.05$) difference between both genders. The obtained

male/female odds compares well with that expected for the sub-population having episodes of gout.

Numbers of attacks were summed up for the zero (new moon), 1st, 2nd ..., 28th and 29th day of the synodic lunar cycle. The obtained counts were divided by the total number of each day of the synodic lunar cycle (e.g. the 0th day) occurring in the whole period of observation. The goal of the statistical analysis, performed on the original data, was to determine whether the fluctuation of the daily numbers around the hypothetical average ($126/8144 = 0.0155$) was random during the investigated cycle.

This has been done with the aid of the cosinor regression (1,2) testing the presence of period lengths of the synodic lunar cycle (SLC), as well as of its 2nd–6th harmonics (i.e. the 1/2, 1/3, ... 1/6 of the cycle) in the gout data, at the level of significance $\alpha = 0.05$.

RESULTS

The results are shown in Figure 1. The gout attacks reveal a relatively regular fluctuation over the synodic lunar cycle. Two of the four high, sharp peaks are very close to the full and the new moon, the other two peaks are not far from either quarter of the moon. They correspond

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¹The original data are available from the senior author's E-mail address on request. The source documentation files are *open to any kind of inspection* in the Research Institute of Rheumatic Diseases.

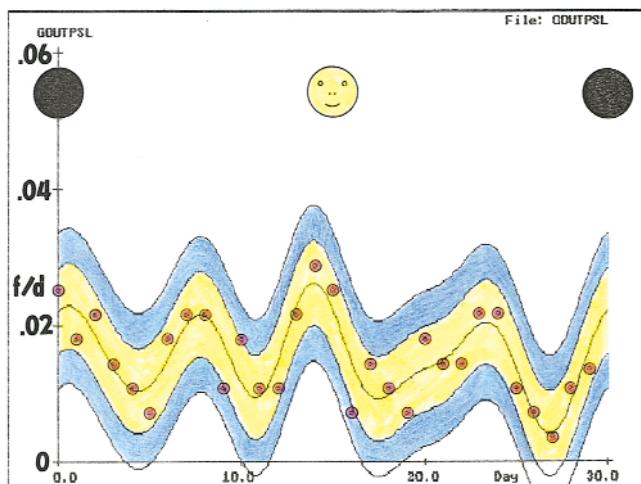


Fig. 1 Attacks of gout during the synodic lunar cycle (data by red dots). The daily frequency of cases (f/d) plotted versus days of the synodic lunar cycle. Both the 95% confidence (narrower, yellow) and 95% tolerance (blue and yellow) corridors are displayed.

with the presence of a significant ($P = 0.00006$) 4th harmonic. The coefficient of determination is 0.711. In other words, 71% of the total variance has been explained by the regression applied.

DISCUSSION

The 7-day cycling may correspond with the circaseptan periodicities, described in clinical conditions originally by Ladislav Dérer in this country (3) and widely elaborated worldwide (4). An analogical lunar dependence was seen by ourselves in bronchial asthma attacks of children (5) and in paroxysmal tachyarrhythmia, experienced by the senior author of the present contribution over two decades (6). In the latter case, however, the peaks and troughs were oppositely located, resulting in relative quiet under syzygies. Substantial differences in pathogenesis of asthma (parasympathicus) and tachyarrhythmia (sympathicus) may explain the reciprocity in suggested behaviour towards the moon.

Lunar effects on life and man are usually discussed with scepticism (7), often rightly, due to inappropriate statistical treatment of the underlying data. There is, however, according to our knowledge no report about gout and the moon at all.

Yet more problematic are the attempts to elucidate possible mechanisms of such putative effects. A plausible approach may concern in some way melatonin – an important signal molecule connected with master pacemaker function. Another approach, more probably relevant to crystal deposit arthropathies, might suppose an immediate physicochemical mechanism at molecular level in the affected tissue. The accumulation of gout attacks around syzygies (new and full moon) could indirectly testify to a gravitational mechanism of such hypothetical action. It should not be very difficult to design corresponding physicochemical experiments on crystallisation of sodium urate monohydrate under various conditions.

Anyway, continuing collection of clinical data concerning the time distribution of gout attacks is mandatory. The hurdle to overcome would, however, be the lack of chronobiologic thinking in many physicians.

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