Eur J Med Res (2003) 8: 414-418

LUNAR PHASE DOES NOT INFLUENCE SURGICAL QUALITY

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Abstract:
Introduction: 10.5% of the German population believes in the effects of lunar phase on disease. The topic is hot in German TV program. It is believed that at new moon the rate of bleeding complications is increased and operations during the waning phase of the moon would be best to avoid complications, pain and scaring. To our knowledge the effect of lunar phase has not been studied in ambulatory surgery.
Patients and methods: 782 patients were evaluated for complications and perception of the personal health after herniotomy, haemorrhoidectomy and crossectomy with partial vein stripping with or without phlebectomy as part of a quality control study. A questionnaire has been sent out to the patients asking the patient to rate postoperative pain, pain medication, restriction of daily activity, mental health and emotion, status of complaints after the operation.
Results: In 782 patients (mean age 50 years) 866 operations were performed. There were no major complications and only in 3.71% minor complications (local bleeding, haematoma, inflammation, abscess, seroma, lymphatic fistula, dehiscence) were observed. The operations were equally distributed to the lunar phases. Complications and patient's subjective perception of pain, restriction of daily activity, mental health and emotion, status of complaints after the operation were not associated with a lunar phase.
Conclusion: The hypothesis that lunar phase influences the outcome of ambulatory operations is not valid. With regard to the organization of operations in the hospital and the patient's uncertainty to decide the right time the lunar phase philosophy may have an socio-economic impact not yet understood.

Key words: ambulatory surgery; lunar phase; inguinal hernia; varicosis; haemorrhoids; quality of life; complications; short stay surgery; quality control

INTRODUCTION

10.5% of the German population believe that the moon cycle influences the outbreak and follow-up of diseases; there is a regional difference with a preference of the southern part of Germany where up to 17.9% trust the moon hypothesis (Freiöl-Institut für Hautforschung 1999). Experts on moon cycle emphasize that full moon has the most negative effects on outcome of surgery; the best phase for operation is descending or waning moon. "Each surgeon will make this discovery or has similar experiences. Complications and infections occur much more frequently at these days. The healing and recovery will take longer. At full moon the incidence of heavy, difficult to control bleedings is increased." (Paungger and Poppe 1994) These recommendations find their scientific basis in a report from EJ Andrews, a surgeon from Tallahassee, Florida, USA (1960) who observed an increased incidence of bleeding complications at full moon. However, the data have been re-analysed – in the original report there is no statistical analysis – and no relationship between moon phase and bleeding complication could be detected (Wunder and Schardtmüller 2002).

Circadian rhythm or chronobiology has been investigated in animals and human beings and there is evidence that this phenomenon may influence the immune response (Holzheimer RG 2002). The effect of lunar phase has been studied at the Clinic for Dermatology, University Graz, Austria in different patient populations in hospitals and no relationship could be revealed (Peters-Engl C 2001; Smolle J 1998). The effect of lunar phase on ambulatory surgery, however, has not been studied yet. We have evaluated the effects of lunar phase on the outcome of ambulatory elective operations and patient's perceptions as part of a quality control study.

PATIENTS AND METHODS

782 patients who were treated for inguinal hernia, varicosis or haemorrhoids were enrolled in the observational study. Information on the patient's age, gender, diagnosis, type of treatment, complications were registered. Patients were all treated by the same surgeon (Dr. Holzheimer). Herniotomy was performed in most instances as Lichtenstein procedure, haemorrhoidectomy according to Parks, and the operation for varicose veins as crossectomy with partial stripping of the saphe-

nous vein with or without phlebectomy. All patients have received general anaesthesia (Propofol) with perioperative pain prophylaxis; in hernia repair antibiotic one-shot prophylaxis (Cefazolin 2g) has been added. 30-45 minutes after the operation we started to mobilize the patients. Patients could leave the surgery unit after 4 hours and were advised to take medication against pain (diclophenac). Patients showed up for control at the day after the operation, day 3/4 and day 10/11 after the operation. Further appointments were made according the follow-up.

The day of operation was then allocated to a lunar phase: ascending, full moon, descending, and new moon. A questionnaire to determine the outcome of surgery

- pain: no pain, mild pain, moderate pain, severe pain;
- pain medication: no medication, one week, two weeks, more than two weeks;
- limitation of daily activity: none, one week, two weeks, four weeks, more than four weeks;
- influence on mental health and emotion: positive, unchanged, negative;
- status of complaints: completely eliminated, improved, unchanged,

was sent out to the patients. Only the questionnaires, which were sent back by the patients, were evaluated; no attempt was made to contact the patients directly by telephone. The data were then transferred into an Excel data sheet and statistical analysis (Chi-square analysis) was performed in the Institute of Informatics and Statistics, Ludwig-Maximilians-Universität München, Germany. Data were considered significantly different when $p < 0.05$.

Results

782 patients (female n = 531 (61.32%; male n = 335 (38.68%) were enrolled in this study; 64% of patients returned the questionnaire. The mean age of patients was 50 years. 139 inguinal hernia repairs – mostly Lichtenstein procedure -, 643 operations for varicose veins and 84 haemorrhoidectomies (modified Parks) were performed by one surgeon.

371 procedures were performed in the rising lunar phase (42.84%), 29 (3.35%) in full moon, 432 (49.88%) in the descending moon, and 33 procedures (3.81%) at new moon.

There was no difference in the distribution of operations with regard to rising or descending lunar phase. We did not observe major complications during the operation or after the operation. 753 patients (96.29%) had no complication at all. There were a few minor local complications (localized superficial inflammation (n = 17), bleeding (n = 5), haematoma (n = 3), seroma (n = 2), local minor abscess (n = 1), lymphatic fistula (n = 1), dehiscence of skin (n = 1) recorded. These minor complications were equally distributed among the lunar phases. Pain (Table 1), pain medication (Table 2), daily activity (Table 3), mental health (Table 4) and status of complaints after operations (Table 5) were not related to the lunar phase. Almost 50% of patients with moderate or severe pain have not taken pain medication at all for personal reasons, supporting unintentional the concept of postoperative pain medication.

Table 1. Comparison of lunar phase and pain classification.

Pain	Waxing	Full moon	Waning	New moon	Sum
No	72	4	71	9	156
Mild	129	14	156	16	316
Moderate	30	2	38	1	71
Severe	5	0	8	0	13
Sum	236	20	273	26	556

Chi-square = 7.005366, FG = 12, p-value = 0.857259. Many patients with moderate and severe pain have not taken pain treatment for personal reasons. There is 1 patient with moderate pain in the new moon group, but there are 8 patients with severe and 38 patients with moderate pain in the waning moon phase.

Table 2. Comparison of lunar phase and pain medication.

Duration	Waxing	Full moon	Waning	New moon	Sum
None	203	17	224	22	467
1 Week	24	2	39	3	68
2 Weeks	8	1	6	1	16
> 2 Weeks	2	0	5	1	7
Sum	237	20	274	26	558

Chi-square = 4.951005, FG = 12, p-value = 0.959595. There are 2 patients with prolonged medication in the new moon group and 11 patients in the waning lunar phase.

Table 3. Comparison of lunar phase and the duration of restriction in daily activity.

Duration	Waxing	Full moon	Waning	New moon	Sum
No restriction	122	11	136	16	285
1 Week	36	4	43	3	86
2 Weeks	26	2	32	3	64
4 Weeks	12	1	17	0	30
> 4 Weeks	8	0	12	0	20
Sum	204	18	240	22	485

Chi-square = 11.889800,FG = 16,p-value = 0.751530. There is no patient with prolonged restriction of daily activity in the new moon group, but there are 29 patients in the waning lunar phase.

Table 4. Comparison of lunar phase and the patients perception of mental health and emotion.

Mental health and emotion	Waxing	Full moon	Waning	New moon	Sum
Positive	78	7	100	7	193
Unchanged	137	11	152	16	316
Negative	17	2	17	3	39
Sum	232	20	269	26	548

Chi-square = 4.243035, FG = 8, p-value = 0.834557. 3 patients with negative emotions are in the new moon group and 17 patients in the waning lunar phase.

Table 5. Comparison of lunar phase and the status of complaints after operation.

Status	Waxing	Full moon	Waning	New moon	Sum
Eliminated	105	8	113	11	237
Improved	114	10	155	14	293
Unchanged	14	0	5	1	20
Sum	235	18	273	26	552

Chi-square = 11.287452, FG = 9, p-value = 0.256519. There is one patient with unchanged status of complaints in the new moon phase and there are 5 patients in the waning lunar phase.

Discussion

The effect of lunar phase has been studied for psychiatric services, homeopathy, delivery, trauma, traffic accidents, myocardial infarction and crime. There are several studies, which have seen an association between moon phase and crime (Thakur and Sharma 1984), self-poisoning (Buckley et al. 1993), myocardial infarction (Sha et al. 1989), misbehaviour (Hicks-Caskey et al. 1991), traffic accidents (Alonso 1993), delivery (Ghiandoni et al. 1998), general practice consultation (Neal and Colledge 2000). However, there are as many studies which do demonstrate no relationship at all with lunar phase (Gutierrez-Garcia et al. 1997; Oderda et al. 1983; Gorvin and Roberts 1994; Amadeo et al. 1997; Wilkinson et al. 1997; Nunez et al. 2002; Owen et al. 1998; Nijsten et al. 1991; Laverty et al. 1998; Coates et al. 1989; Maldonado et al. 1991; Waldhoer et al. 2002).

As there are no studies on lunar phase and elective ambulatory operations we have evaluated the post-operative outcome of 866 operations in 782 patients with regard to lunar phase. Complications after ambulatory operations are per se rare events (Noppeney et al. 2001). We observed no major complications and the number of minor complications were too small to allow us to detect any difference with regard to lunar cycle. However, pain, pain medication, daily activity, mental health and the status of complaints after operation, all subjective reactions of the patient, which might be influenced by lunar phase, could be evaluated due to sufficient large numbers per group. Yet, there was no relationship to lunar phase detectable.

Some weakness of the study needs to be addressed. The questionnaire used was modified according to the Short Form 36, a validated questionnaire to measure the quality of health (Jenkinson et al. 1996), and we have not calculated

an index, which would be comparable to other studies. Similar and well-accepted systems did not exist in Germany.

The results of our study are in agreement with other recently published studies investigating the effect of lunar phase on outcome of patients after operations. Outcome of breast cancer patients was not different when timing of breast cancer surgery during lunar cycle was considered (Peters-Engl et al. 2001). In a survey concerning postoperative nausea and vomiting (PONV) an unexpected high number of participants stressed the impact of environmental factors, e.g., weather, lunar phase. However, in 2488 patients who were followed up for 24 h postoperatively the days with a high or low incidence of PONV were equally distributed within the four phases of the moon ($p = 0.97$; chi 2-test with Yates correction) (Eberhart et al. 2000). Others observed no correlation of lunar phases with acute coronary events leading to myocardial infarction or sudden death in 1240 patients (Eisenburger et al. 2003). At the Dermatology Clinic, University Graz, Austria consecutive inpatients with surgical procedures including abdominal, vascular, cardiac, thoracic, plastic, and orthopaedic operations and ambulatory patients on homeopathy showed no relationship to lunar phase (Smolle et al. 1998).

The discussion of lunar phase may have other socio-economic aspects. Hospital organization is already under pressure and demands to allocate resources with regard to lunar phase may have detrimental effects (Paungger and Poppe 2003). With regard to the anxiety of patients faced with the necessity of an elective operation it has been criticized that patients are unnecessarily put into a state of uncertainty when planning the right time of the operation (Wunde and Schardtmüller 2002).

In humans there is no evidence that lunar phase has an effect on outcome of patients after ambulatory elective herniotomy, vein stripping or haemorrhoidectomy. It may be true that "another lunatic hypothesis bites the dust" (Chapman S 2000).

Acknowledgement: The authors thank Dr. Helmut Exner (Institut für Datenverarbeitung und Statistik, Universität München) for the statistical analysis.

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Received: August 19, 2003 / Accepted: September 9, 2003

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