

CAN AROMATHERAPY PROMOTE SLEEP IN ELDERLY HOSPITALIZED PATIENTS?

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Background: Commonly used sedatives have an increased risk of side-effects in older people, especially falls. Complimentary therapies, if effective, could provide a safer alternative.

Methods: A prospective controlled study on aromatherapy using Roman Camomile oil was evaluated in 43 patients on a variety of elderly care and psychiatry of old age wards. A specially designed sleep chart documented the patients as being Awake and Calm (AC), Awake and Restless (AR), or sleeping (S). Following the control week, two drops of oil were placed on the patients' pillows and the sleep ratings were repeated.

Results: Subjects spent statistically significantly more time asleep in the study week than the control. Data stratified by psychiatric diagnosis and care setting indicated that non-dementia patients had the largest increase in sleep in the study period [89-100.5 periods of sleep ($p=0.005$)], followed by patients on acute medical and psychiatric functional and organic assessment wards [87.6-97.9 periods of sleep ($p=0.005$)].

Conclusion: Aromatherapy causes modest but statistically significant increase in sleep in the sleep deprived

Key words: Elderly, hospital wards, sleep, aromatherapy, Roman camomile oil

INTRODUCTION

The use of pharmacological night sedation in elderly patients can be accompanied by unacceptable side-effects. When evaluating patients of all ages, those who fell were approximately 2.7 times as likely to have received a psychotropic drug compared with age-matched controls, and Temazepam and Diazepam were among those drugs significantly associated with falls.¹ In a study of nursing home residents where 1,560 falls led to hospitalization, the two classes of drugs significantly associated

with the falls were (1) antipsychotic agents and (2) anxiolytics/sedatives/hypnotics.² A 10-year survival analysis of 500 elderly men suggested that the combined use of anxiolytic-hypnotic drugs with analgesics was associated with an increase in all-cause and ischaemic heart disease mortality in this sample.³ These drug combinations are commonly used in elderly people. Importantly, the finding that the use of hypnotics was associated with increased mortality was echoed in the American Cancer Society Cancer Prevention study.⁴ It is difficult, however, to prove direct cause and effect, and it has been suggested that reported self-medication for disturbed sleep may provide an epidemiological marker for a group within which levels of morbidity and mortality are particularly high.⁵ The aim of this study was to test the hypothesis that Roman Camomile oil promotes sleep and reduces restlessness in inpatient elderly settings.

SUBJECTS AND METHODS

A prospective controlled study of the hypnotic effects of Roman Camomile oil was carried out over a 14-month period commencing in October 1997. A pilot study, set up on four wards, assisted in the design of a "user friendly" sleep chart upon which the subjects' sleep patterns were recorded half-hourly by nursing staff. The patient sample was selected from nine units/wards within Tower Hamlets Healthcare NHS Trust: the dementia assessment unit, the old age psychiatry continuing care unit, the old age functional illness psychiatric ward, two elderly care continuing-care wards and four elderly care acute wards. Only those patients likely to stay in hospital for a 2-week period and

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who were reported as having difficulty sleeping by ward nursing staff were selected for the study, and subjects who were acutely physically or psychiatrically ill were excluded. However, the number of patients participating in the study at any time was limited by the number of patients on the wards that nursing staff were able to monitor in addition to their other duties. In general, no more than two patients on any ward could be entered into the study at any one time. Due to this constraint, the study ran for a prolonged period, in order to recruit a sufficient number of patients to demonstrate any trends. In terms of informed consent to the study, subjects fell into three groups: 1) those who were able to consent signed a consent-form, and an information sheet was given to them and their nearest relative; 2) for those who suffered with moderate / severe cognitive impairment and were unable to give informed consent, assent was obtained from their nearest relative, who was given written information about the study; 3) subjects with mild cognitive impairment, where ability to consent was equivocal, were assessed by an old age psychiatrist and were then placed in one of the two above groups. Written information was also given to ward staff. A copy of the consent-form was put in each patient's notes and a copy was sent to each of the researchers. The study received local ethics committee approval.

Once enrolled in the study, each patient's sleep pattern was monitored on the ward by nursing staff for half-hour periods starting at 9:00 pm and ending at 7:00 am the following morning. The patient was recorded as being Awake and Calm (AC), Awake and Restless (AR), or Sleeping (S). Each patient acted as his or her own control. In the first week of the study, baseline sleep ratings were carried out. In the second week, two drops of Roman Camomile oil were placed on the patient's pillow and sleep ratings were repeated. A second proforma sheet was designed to collect data on each patient's diagnosis, any sleep disturbance symptoms suffered prior to the trial, e.g. pain, shortness of breath, etc. A note was made of each patient's medication in both the control and study periods, together with any change in medication or change of dose of existing medication over the course of the trial. Relevant medication was classed as minor tranquillizers, e.g. benzodiazepines, major tranquillizers, i.e. neuroleptics, and other sedative drugs, e.g. antidepressants. In addition, the researchers made a subjective assessment of the form of any sleep disturbance, i.e. ini-

tial insomnia, early waking, in both the control and study period by surveying the observations made by the nursing staff on the sleep charts. The consultant firm responsible for the care of the patients was free to make any changes to their medication during the trial period, i.e. the trial ran in parallel to ordinary clinical care. Any patient who disliked or was distressed by the smell of the oil was withdrawn from the trial. Data was entered into SPSS and were analyzed by t-tests and chi-square tests for parametric and non-parametric data respectively.

RESULTS

A total of 58 patients entered the study. Eight of these withdrew; three were discharged before completing the study, three withdrew as they did not like the smell of the Roman Camomile oil, one patient absconded from the ward before completing the study, and one patient withdrew before starting the aromatherapy oil, giving no reason. In addition, two patients' forms were mislaid and five subjects died during the trial period, for reasons unconnected to the study. Therefore, 43 subjects completed the trial. The numbers and percentages given refer to those subjects on whom that item of information was recorded. The number of half-hourly sleep observations recorded by the nursing staff was very high. Of a potential total of 140 observations per patient per week, a mean number of 135.0 were recorded in the control week and 136.2 in the study week. The differences were not significant ($t = -1.28, p > 0.2$).

Thirteen subjects (30.3%) were resident on psychiatric wards (one – functional ward, six – dementia assessment unit, six – dementia continuing care), and 30 (69.8%) were resident on medical wards (22 elderly care acute wards and eight elderly care long stay). Thirty-two subjects (74.4%) were coded as having a psychiatric diagnosis (Table 1).

Physical symptoms which were likely to interfere with sleep were recorded in 14 patients (32.6%) (Table 2).

Sleep chart results were added and averaged for all 43 subjects in the control and study periods,

Table 1. Number of Patients with a Psychiatric Diagnosis

| | |
|------------------------|----|
| Alzheimer's disease | 4 |
| Multi-infarct dementia | 4 |
| Dementia (unspecified) | 14 |
| Depression | 9 |
| Other | 1 |

Table 2. Number of Patients with Physical Symptoms

| | |
|----------|---|
| Pain | 4 |
| Dyspnea | 2 |
| Nocturia | 1 |
| Pruritis | 2 |
| Cough | 1 |
| Other | 4 |

which gave results for the mean number of hours of AC, AR or S for the whole group in the control and study periods. Subjects spent a mean time of 34.6 half-hourly periods awake and calm in the control week and 30.8 half-hourly periods awake and calm in the study week. Thus, subjects spent significantly fewer hours awake and calm in the study period ($t=2.38$, $p=0.02$). Subjects spent relatively few periods awake and restless during the control and study weeks (14.8 periods and 11.7 periods respectively, $t=1.75$, $p=1.56$, not significant). There was, however, a trend for subjects to spend less time awake and restless in the study week. Subjects were coded as asleep for a mean of 85.6 periods in the control week and 93.7 periods in the study week. Subjects spent significantly more time asleep in the study week than the control week ($t = -3.09$ $p=0.004$). In real time, these results indicate that subjects spent a mean of 6.1 hours per night asleep in the control week and 6.7 hours of sleep per night in the study week.

This analysis was then repeated, stratified by psychiatric diagnosis and care setting. When data on 22 patients with a diagnosis of dementia was analyzed separately, these patients had a mean of 82.4 periods asleep in the control week and 87.3 asleep in the study week. The trend for increased sleep in the study period in this subgroup failed to reach statistical significance ($t=1.12$, $p>0.2$). When, however, data on 21 non-demented patients was analyzed separately, this group had a mean of 89.0 periods of sleep in the control period and 100.5 periods of sleep in the study period. The increase in sleep in the study period was statistically significant for this subgroup ($t=-3.02$, $p=0.005$). When care setting was considered, there was statistically significant increased sleep in the study period (mean 97.9 periods) compared with the control period (mean 87.6 periods) for 29 patients on acute medical and psychiatric functional and organic assessment wards ($t=-3.02$, $p=0.005$). When the data on 14 patients resident in medical and psychiatric long-stay wards were analyzed, there was a trend for increased periods of sleep in the study period (mean 85.1 periods)

compared with the control period (mean 81.6 periods), but this difference was not statistically significant ($t=-0.94$, $p>0.3$).

The researchers rated the pattern of sleep on each of the sleep charts for initial insomnia, early morning waking, and whether sleep had been interrupted once or more. There were statistically significant decreases in numbers of subjects rated as having initial insomnia, early waking and sleep interrupted on more than one occasion in the study period. However, there was also a significant increase in the numbers of subjects rated as having sleep interrupted once in the study period (Table 3). This would suggest that there was a tendency for the aromatherapy to reduce periods of multiple waking to single periods of waking in affected subjects.

Researchers noted the use of sedative drugs prescribed by the consultant firm during the control and study periods (Table 4). More subjects were given minor tranquillizers during both the day and at night in the study period (i.e. with oil) than in the control period. However, fewer subjects were given major tranquillizers during the study period, day and night, than in the control period, and fewer were given other sedatives during the study period, day and night, than during control period. Table 4 shows in particular that the independent use of sedative drugs at night remained the same in control and study periods for minor tranquillizers and that there was a reduction in the use of major tranquillizers and other drugs with sedative actions at night during the study period. Therefore, the differences in sleep during the study period cannot be attributed to the use of sedative medication.

DISCUSSION

The effects of aromatherapy on mood and behaviour were recognized historically. Michel de Montaigne (1533-1592) in an essay entitled *On Smells* (translated by Screech, 1995) wrote "It seems to me that doctors could make better use of smells than they do, for I have frequently noticed

Table 3. Comparison of Sleep Pattern in Control and Study Period

| Variable | Control | Study | p value |
|------------------------------|---------|-------|---------|
| Initial Insomnia | 23 | 15 | <0.05 |
| Early Morning Awakening | 22 | 10 | <0.05 |
| Sleep interrupted once | 16 | 25 | <0.05 |
| Sleep interrupted more often | 14 | 8 | <0.05 |

Table 4. Use of Tranquillizers and Sedatives (43 Patients)

| Variable | Control | Study |
|-----------------------------|---------|-------|
| <u>Minor Tranquillizers</u> | | |
| Day | 1 | 2 |
| Night | 5 | 5 |
| <u>Major Tranquillizers</u> | | |
| Day | 6 | 5 |
| Night | 11 | 9 |
| <u>Other Sedatives</u> | | |
| Day | 10 | 9 |
| Night | 6 | 5 |

that, depending on which they are, they variously affect me and work upon my animal spirits;....”⁶ There has been modern interest in the use of complementary therapies with growing public demand.⁷ Much of the evidence, however, rests on single case studies, studies with low numbers and uncontrolled studies, such that there have been recent calls for more rigorous research.⁸⁻¹⁰ It has been suggested that aromatherapy can be beneficial to older people with sleeping difficulties.^{11,12} Two of the oldest and most widely known oils, Lavender (*Lavandula Officinalis*) and Roman Camomile (*Anthemis Nobilis*), are said to have sedative properties.¹³ A small observational pilot study of two elderly, cognitively-impaired and sleep-disturbed patients found that Roman Camomile oil was particularly helpful in promoting sleep.¹⁴ The exact mode of action of aromatherapy oils is unknown, but it is likely that psychological as well as physiological factors are important, and it is interesting to note that EEG and reaction time changes have been noted with the use of aromatherapy.¹⁵

To our knowledge, this is the largest controlled trial of the use of aromatherapy as night sedation in elderly people in a clinical setting, to date. However, this study must be considered a preliminary one, because there are methodological problems inherent in the design, which are discussed below. The results demonstrate that for the group of patients studied, the use of aromatherapy at night significantly increases the total amount of sleep recorded. The quantity of sleep increase during the study period was by 0.6 hours per night, but over a one-week period the increase amounts to 4.2 hours per week. Although modest, this increase may be clinically significant in sleep-deprived patients. It is also noteworthy that the increase in sleep in the whole group was statistically highly significant.

When the data were broken down to smaller groups, it is interesting that the results of increased sleep in study compared with control periods only held true for the patients in acute medical settings and not for those with a diagnosis of dementia or those in long-stay care settings. However, in these last two groups there was a non-statistically significant trend towards increased sleep in the study period. It should be noted that the analyses of the results of the patients with dementia and long-stay patients were carried out on fewer patients and that future studies may need to look at larger samples to demonstrate a statistically significant result in these groups. The aromatherapy literature suggests that people may be aromatherapy responders or non-responders. The results are unlikely to be attributable to difficulties with recording sleep, because the nurses recorded over 96% of potential observations. The results are also unlikely to be attributable to independent changes in sedative medication, as described above.

The study has some major methodological problems. First, the aromatherapy was always given after the control week of sleep observation, and the fact that elderly patients on the acute wards may have taken a week to settle in hospital, or that their physical illnesses may have been controlled, thus enhancing sleep in the second week of the trial, cannot be ruled out. A trial where aromatherapy treatment is randomized between the first and second weeks will be required to overcome this difficulty. Second, aromatherapy treatment has a characteristic smell, which is difficult to control for. We opted to use a control week without aromatherapy, because most essential oils, which could be used as controls, have activating or sedative effects that could interfere with the trial. However, because of this, neither patients nor staff were blinded to the intervention. In particular, this could have affected the sleep ratings given by staff. Third, staff recorded sleep in the three defined categories without the benefit of intra or inter-rater reliability studies of sleep observations. Finally, the fact that not all eligible patients on a ward could be entered into the study due to restricted monitoring capacity by busy ward staff, may have created a further source of selection bias.

Given the well-documented problems with the use of sedative night medication in elderly people, we believe that these results suggest that it may be useful to try Roman Camomile aromatherapy as a

trial intervention in the sleep disturbed. Larger and methodologically more robust studies are required to understand more about specific subgroups of patients who might optimally benefit from this complimentary approach to care.

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