

Recent interest in the use of Snoezelen as an intervention for agitated behaviour in patients with dementia remains supported by limited evidence of efficacy. This pilot study aimed to develop an approach for assessing the effects of Snoezelen on agitated behaviour in patients with dementia and its comparability with an existing control intervention. Ten patients with dementia were randomised to receive a 4-week course of either Snoezelen or reminiscence therapy. The therapeutic effects were assessed using the Agitation Behaviour Mapping Instrument (ABMI) and the Cohen-Mansfield Agitation Inventory (CMAI) and by heart rate recording.

Differences in dementia severity between the two groups hindered direct comparison of outcomes. Both interventions were well tolerated and the majority of both Snoezelen and reminiscence sessions were rated positively. The ABMI ratings suggested that Snoezelen might have reduced agitated behaviour during and immediately after the session but that this effect was short-lived. The CMAI scores indicated reduced agitated behaviour during the intervention period. Heart rate data showed both decreases and increases during the sessions for different participants.

With minor modifications, the measures used will be appropriate for a full-scale comparative trial. Both interventions may have helpful short-term effects and while for some patients the sessions are primarily relaxing, for others they may have a more stimulating effect.

# A Pilot Study of the Physiological and Behavioural Effects of Snoezelen in Dementia

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## Introduction

Snoezelen therapy is increasingly used in the management of patients who have dementia, especially when there are associated behavioural and psychological problems. It is an intervention commonly employed by occupational therapists in dementia and other fields of care. Snoezelen is a concept that originated in the Netherlands in the field of learning disabilities in the 1960s and 1970s (Cleland and Clark 1966, Hulsege and Verheul 1987). Nowadays it is used in the United Kingdom and many other parts of the world, not only with people with learning disabilities but also in dementia care, terminal care, child psychiatry and pain clinics.

The concepts behind Snoezelen arose out of the observation that organised activities for people with learning disabilities consisted mainly of performance-orientated tasks. These activities may place excessive expectations on patients and fail to make good use of their potential to enjoy a variety of stimuli. People with severe and multiple handicaps often experience very limited psychological and

sensory stimulation and have limited opportunities for individual choice and control. Studies of sensory deprivation in the 1960s suggested that unchanging, monotonous environments are stressful and that thinking and concentration could be negatively affected (Leiderman et al 1958, Zuckerman 1964). This provided a possible theoretical basis for the therapeutic effects of Snoezelen.

Snoezelen creates a relaxing, stimulating and failure-free environment. In Snoezelen rooms, unpatterned visual, auditory, olfactory and tactile stimuli (stimuli that follow no specific pattern or form and require no recognition or high level cognitive processing) can be offered (Baker 1998). No special tasks need to be performed and the patient is encouraged to explore the room at his or her own pace. The non-directive therapy and the unpatterned stimuli help to create a relaxing effect (Baker et al 1997a). This explains the word Snoezelen, which freely translated is an amalgamation of the Dutch words explore and relax.

The similarity between the care for people with dementia and those with learning disabilities was one of the reasons

for Snoezelen therapy to expand into dementia care. In particular, behavioural and psychological symptoms in dementia could potentially be responsive to multisensory treatments. Although these symptoms are of enormous clinical importance (Rabins et al 1982, Knopman et al 1988), definitive interventions for them are not yet available (Auer et al 1996). Research in this area has been relatively sparse and mainly focused on pharmacological interventions. The few randomised controlled trials of antipsychotic drugs for behavioural and psychological symptoms in dementia indicated only moderate efficacy (Schneider 1996, Lanctot et al 1998) while side effects are an important problem.

For these reasons, research into the effects of non-pharmacological interventions such as Snoezelen is important, although so far there have been only four studies with 10 or more patients published (Moffat et al 1993, Holtkamp et al 1997, Baker et al 1998, Hope 1998). Positive effects included a reduction in the levels of disturbed behaviour (Holtkamp et al 1997) and positive changes in the levels of enjoyment, the ability to relate to others, talk spontaneously and recall memories, and attentiveness to the environment (Baker et al 1998). Moffat et al (1993) found an increase in ratings of happiness and interest and a reduction in ratings of sadness and fear.

This article describes a pilot study in which the effects of Snoezelen were compared with reminiscence therapy in a group of patients with dementia and with associated agitation. No other published research has focused specifically on patients with dementia who exhibit significant agitated behaviour and assessed the impact of Snoezelen on that behaviour. Reminiscence therapy was selected as the control intervention because it is an established, generally well tolerated and non-task-orientated therapy in dementia (Woods et al 1992, Robertson 1996). It was carried out on a one-to-one basis rather than in a group setting in order to control for the effect of staff attention. In the unit where this research was conducted, reminiscence is an established activity with dementia patients of all abilities. Reminiscence has been shown to be beneficial with people with severe dementia (Finnema et al 2000) and the authors felt that, although reminiscence with these patients is perhaps different to reminiscence with individuals in the earlier stages of dementia in terms of their ability to communicate verbally, they remain able to appreciate the materials presented to them and benefit from the interaction with others.

The inclusion of an objective measure of the level of agitation/relaxation was considered to be required. Monitoring a physiological response such as heart rate was felt to be a valid approach to this and had been used successfully in a study of Snoezelen in learning disabilities (Shapiro et al 1997).

The main aim of this pilot study was to evaluate the feasibility of using a detailed approach to behavioural and physiological assessments before, during and after Snoezelen sessions for patients with various forms of dementia.

## Method

### Setting and participants

This randomised controlled pilot study was primarily based at a day hospital for psychiatry for elderly people, although one patient was recruited from an acute organic assessment ward. Patients were included in the study if they had a clinical diagnosis of dementia and were rated by the staff as exhibiting significant agitated behaviour. They were excluded if they had a significant hearing impairment, had visual acuity of less than 3/6, were non-English speaking or consumed more than 21 units of alcohol per week. Any participant who developed evidence of delirium or significant ill health or had any change in psychotropic medication immediately before or during the trial was withdrawn. As the participants were unable to give informed consent, written consent was obtained from their next of kin. The project was approved by the local research ethics committee.

### Procedure

The participants were randomised (using a sealed-envelope technique) to receive either eight Snoezelen or eight reminiscence therapy sessions, which took place twice weekly and lasted up to 40 minutes. The session was terminated immediately if the participant expressed the desire to leave.

The Snoezelen therapy was given in a specially designed multisensory room, featuring comfortable seating and equipment that would create a relaxing but also stimulating atmosphere. The equipment included a projector with special-effects wheels projecting moving pictures slowly around the room, spotlights and a mirror ball, a fiberoptic spray, music equipment, a bubble tube and an aromatherapy oil diffuser. Each participant was accompanied by one of the therapists (JR, NR, DAS), who had experience of both Snoezelen and reminiscence therapy. The therapist would facilitate rather than direct the participant to explore the environment. Reminiscence therapy also took place in a separate room, with a one-to-one participant/therapist ratio.

At baseline, participants' dementia severity and cognitive impairment were rated using the Clinical Dementia Rating scale (CDR; Hughes et al 1982, Berg 1988) and the Mini Mental State Examination (MMSE; Folstein et al 1975) respectively. The Cohen-Mansfield Agitation Inventory (CMAI; Cohen-Mansfield et al 1989a) was completed at baseline, after the 4 weeks of therapy and again after 4 weeks without intervention, both with the main carer and with the nurse-keyworker.

The Agitation Behaviour Mapping Instrument (ABMI; Cohen-Mansfield 1986, Cohen-Mansfield et al 1989b, 1992) was completed by one of the investigators for four 3-minute periods each session: once before the session, then immediately after, 15 minutes after and 30 minutes after the session. The Interact scale (Baker and Dowling 1995, Baker et al 1997b) was completed immediately after each session by the therapist, who also made detailed notes about the session. The participant's heart rate was recorded from 10 minutes before each session, during the session and until 30 minutes after the session.

## Measurement

The MMSE is an 11-item scale which assesses cognitive function. Summing the points assigned to these items gives a maximum score of 30 (that is, good cognitive function). A score of 23 or less is frequently used as an indication of cognitive decline sufficient for a diagnosis of dementia.

The CDR is a measure in which dementia severity is rated on a five-point scale: none (CDR = 0), questionable (CDR = 0.5), mild (CDR = 1), moderate (CDR = 2) and severe (CDR = 3). In this study, the CDR was rated according to the method described by Heyman et al (1987) and Dooneief et al (1996), in which two further categories are allocated to reflect the later stages of dementia and a higher degree of impairment: profound (CDR = 4) and terminal (CDR = 5).

The short-form CMAI was used to measure the level of agitation over the previous 2 weeks, using five-point Likert scales to assess the frequency of verbal, physically non-aggressive and physically aggressive agitated behaviour (the reported reliability for this scale is 0.82; Cohen-Mansfield 1991).

The ABMI is designed to measure the frequency of agitated behaviour during 3-minute episodes by direct observation. It distinguishes between verbally aggressive, verbally non-aggressive, physically aggressive and physically non-aggressive behaviours. Good interrater reliability (greater than 0.975) for this scale had previously been demonstrated with the five investigators in the present study. This scale was scored by allocating 1 point for each discrete occurrence of an agitated behaviour and 10 points for a continuously agitated behaviour.

The Interact was specifically designed to measure the effects of Snoezelen. The scale includes 22 items about mood, speech, relating to other people, relating to the environment, need for prompting, stimulation level and wandering, restless and aggressive behaviour, using a five-point Likert scale to reflect the behaviour in the session. The direction of change of each behaviour during the session can also be indicated.

The heart rate was measured using an unobtrusive device to record it at one-minute intervals (CardioSport 2001 heart rate monitor). The participants were not required to wear the heart rate monitor if they indicated that they did not want to do so and the device was removed if it appeared to give them discomfort or cause distress.

## Analysis

The data were examined using the Statistical Package for Social Sciences (SPSS, version 10.0) for Windows. Statistically significant differences between the interventions were not predicted because of the small number of participants. Comparisons between the two intervention groups were carried out using the Wilcoxon Mann-Whitney U test.

## Results

A total of 15 patients were referred to the project and met the entry criteria. Ten of these patients were included in the analysis. Five patients dropped out of the study either before the intervention had started or in the early stages of the intervention owing to physical illness (three patients), the patient moving out of the area (one patient) or because of discharge to residential care.

A total of 14 out of a possible 80 sessions were missed, the most frequent reasons being transport difficulties and participants not attending the day hospital. One participant missed two sessions because it was felt that some of the previous sessions had possibly had a negative effect. One participant missed one session because she was too agitated to participate.

The Snoezelen and the reminiscence groups were not significantly different in terms of gender and age (Mann-Whitney, NS). However, baseline measurements revealed a marked difference in terms of severity of dementia and degree of cognitive impairment (Table 1). The Snoezelen group scored lower on the MMSE, although owing to the small numbers this did not quite reach statistical significance (Mann-Whitney,  $p = 0.053$ ). The population from which the sample was taken was heterogeneous and, therefore, it was very likely that two small samples taken from that population would be different because the few individuals in each group were likely to be varied in their characteristics.

This marked difference at baseline greatly limits the validity of any comparison between the two groups on the measures taken, because any difference observed may be attributable to the basic difference in the level of cognitive functioning of the participants in each group. However, because this was not the aim of the pilot study anyway, further analysis of the data is primarily of a descriptive nature.

### Reported agitated behaviour

The CMAI was found to be easy to use and appeared to provide adequate information for the purpose of this study. The results (Fig. 1) showed a tendency for the CMAI to be lower at the end of the 4 weeks' therapy for both the Snoezelen group and the reminiscence group. This tendency was preserved at follow-up, apart from the scores in the Snoezelen group rated by the keyworker.

### Observed agitated behaviour

The ABMI was easy to use after some practice. The Snoezelen and reminiscence groups were similar in their levels of observed agitated behaviour prior to their sessions

Table 1. MMSE and CDR scores

	Snoezelen					Mean	Reminiscence					Mean
	P1	P2	P3	P4	P5		P6	P7	P8	P9	P10	
MMSE score	1	0	0	0	8	1.8	0	21	11	13	23	13.6
CDR rating	3	4	4	4	2	–	4	1	2	2	1	–

Fig. 1. CMAI total agitation scores as rated by the carer and the keyworker.

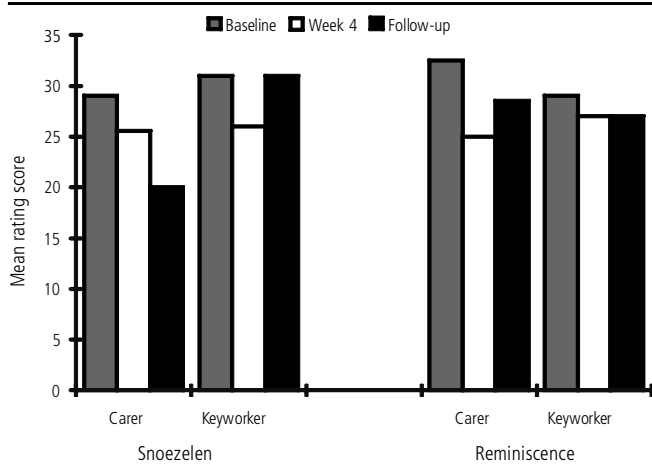
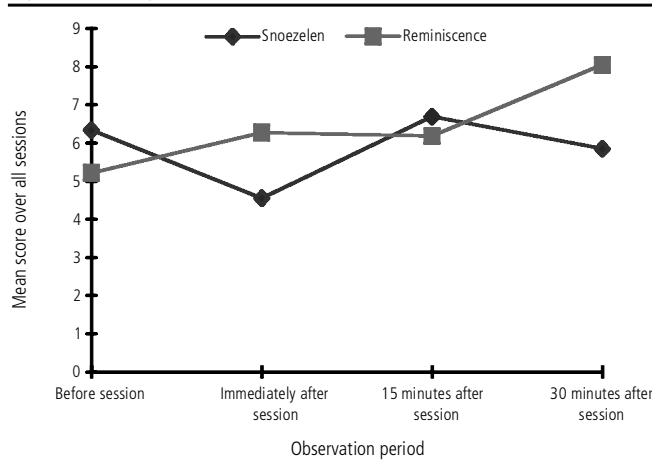


Fig. 2. Total agitated behaviour from the ABMI.



(see Fig. 2). The results showed that there was a slight tendency for the total ABMI score to be lower just after the session as compared with before the session in the Snoezelen group, but this was not sustained 15 and 30 minutes after the sessions. In the reminiscence group, there was a tendency for the total ABMI score to increase over the four time-points.

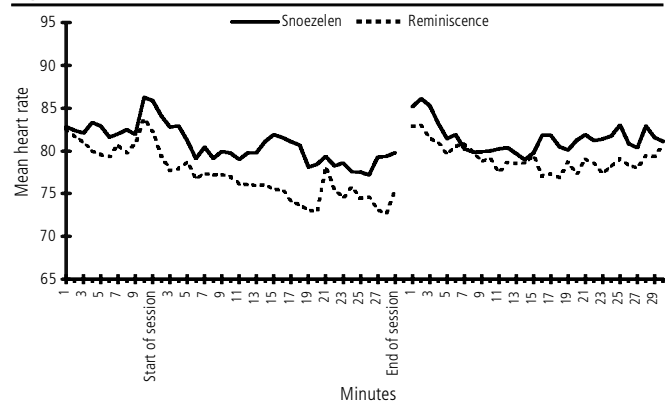
### Behaviour during the sessions

The Interact scale was found to be only moderately useful in determining the effects of the therapy sessions, because the items were not focused on agitated behaviour. The ratings of change of behaviour within the sessions indicated that both the Snoezelen and the reminiscence therapy had a positive effect on the participants' behaviour. A negative change in any of the items happened only occasionally.

The notes made by the therapists immediately after the sessions were found to be useful in explaining change in agitated behaviour and gave information about which approaches were most helpful for each participant. The analysis of the comments revealed that, apart from two Snoezelen sessions, the effects of the therapies could be either relaxing or stimulating or both.

In the two Snoezelen sessions perceived as having a possible negative effect on a participant's behaviour, the

Fig. 3. Mean heart rate.



participant's agitation level was high before the sessions started. During both sessions her agitation increased and the therapist terminated the session. The same participant also had a number of positive sessions. On those occasions she was agitated at the start of the session, but her response to the music and becoming engaged in the equipment reduced her agitation.

### Heart rate

The heart rate monitor was well tolerated and provided reliable data in eight out of the ten participants (four from each group). One participant had a pacemaker, contraindicating the use of a heart rate monitor, and one participant refused to wear the heart rate monitor after the first session.

Heart rate peaked at the start and the end of both the Snoezelen and reminiscence sessions (Fig. 3). This was unlikely to be caused by the effects of the therapy itself. Further analysis revealed that the direction of change of the heart rate appeared to be dependent on the behaviour and activities, as commented on by the therapists just after the sessions. In many cases (in both groups) the participants would engage well and become less agitated, resulting in a drop in heart rate. In other cases where the participants were not agitated prior to the session, it appeared that they benefited from the therapy but that the overall effect was stimulating rather than relaxing, resulting in an increase in heart rate. In the only participant who had two unsuccessful sessions, the increase in agitation level was mirrored by an increase in heart rate. In the sessions that went relatively well, the heart rate remained about the same.

### Discussion

The main aim of the study was to assess the feasibility and usefulness of the measurement instruments used. A secondary aim was to identify whether there were any large effects of the interventions which might be relevant in refining the methodology for the definitive study.

From the analysis of the Interact scale and the comments made by the therapists shortly after the sessions, it appeared that both the Snoezelen and the reminiscence sessions were generally well tolerated and had a positive therapeutic effect.

This is comparable with other studies (Holtkamp et al 1997, Baker et al 1998). The Interact scale was relatively easy to complete, but many items were less applicable to agitated behaviour. Furthermore, the Interact scale does not give summary scores and the item-by-item analysis increases the risk of a false-positive result (type 1 error).

The comments made by the therapists were useful in interpreting the changes in heart rate. An overall relaxing effect of the therapy resulted in a decrease in heart rate. An increase in heart rate, however, could be caused either by the participant being positively stimulated by the session or by an increase in his or her agitation. These results are consistent with the findings of Shapiro et al (1997) in the context of learning disabilities.

The behaviour mapping provided a large amount of information over a relatively limited time period. The total mapping time per session was 12 minutes, which is too short to measure change in infrequent behaviours such as aggression. The behaviour mapping, therefore, essentially gave information about non-aggressive agitated behaviours. There are a number of possible explanations to account for the persistence of agitation following the therapy sessions. It could be that there was little or no generalisation of the therapeutic effects outside the sessions. Another important explanation is that during the third and fourth observations the participants were either about to have lunch or awaiting transport to go home, times when there is normally an increase in agitation. In future research, baseline behaviour mapping will be included before the intervention period to account for daily fluctuations of agitated behaviour.

The CMAI was found to be easy to use and to provide adequate information about long-term changes in behaviour in the study group. There was a trend that agitation levels were lower after 4 weeks of intervention. That this trend never reached significant levels has a number of possible explanations. In the first place, the numbers are small. It is also possible that the effects of Snoezelen do not carry over to the behaviour during the rest of the week. This would be consistent with the study by Moffat et al (1993), who in their uncontrolled study reported no change between baseline and post-intervention measures of mood and behaviour. Baker et al (1998), however, reported a significant improvement in socially disturbed behaviour at home for those patients who had received Snoezelen sessions, suggesting a longer-term effect.

There are some specific methodological difficulties with this type of study. In the first place, the quality and quantity of attention that the participants receive during therapy can be a confounding factor. The therapists, the therapist/participant ratio and the duration of the intervention were, therefore, the same for both therapies. Another issue is that of blindness of the assessors. The scales in this study were completed by raters who knew which intervention the participant had received and so were subject to observer bias. An objective measurement like heart rate monitoring was, therefore, important. The changes in heart rate, however, need to be interpreted with

care, since not only does agitation have an effect on the heart rate but so do positive stimulation, activity, physical illness and medication.

This study demonstrated that it is possible to recruit suitable participants who will tolerate the procedures and therefore helped in the planning of future research. Baseline behavioural mapping will be introduced and a cross-over design will be used to minimise the effects of difference in independent group variables. Furthermore, the Interact scale will be modified and tailored to the patient group and specific area of interest.

The authors have found the effects of Snoezelen on agitated behaviour in patients with dementia encouraging and are looking forward to the results of their next project. They hope to add to the limited research evidence on the effects of Snoezelen in dementia and to inform staff who use the intervention in this field of care, many of whom are occupational therapists, of the relative benefits of Snoezelen for this patient group.

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