

Music therapy in moderate and severe dementia of Alzheimer's type: a case-control study

H. B. Svansdottir and J. Snaedal

Geriatric Department, Landspítali University Hospital, Reykjavík, Iceland

ABSTRACT

Background: Music therapy is a potential non-pharmacological treatment for the behavioral and psychological symptoms of dementia, but although some studies have found it to be helpful, most are small and uncontrolled.

Methods: This case-control study was carried out by qualified music therapists in two nursing homes and two psychogeriatric wards. The participants were 38 patients with moderate or severe Alzheimer's disease (AD) assigned randomly to a music therapy group and a control group.

Results: The study showed a significant reduction in activity disturbances in the music therapy group during a 6-week period measured with the Behavior Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD). There was also a significant reduction in the sum of scores of activity disturbances, aggressiveness and anxiety. Other symptoms rated by subscales of the BEHAVE-AD did not decrease significantly. Four weeks later the effects had mostly disappeared.

Conclusions: Music therapy is a safe and effective method for treating agitation and anxiety in moderately severe and severe AD. This is in line with the results of some non-controlled studies on music therapy in dementia.

Key words: Alzheimer's disease, dementia, music therapy

Introduction

A majority of Alzheimer's disease (AD) patients show signs of psychiatric distress and in many cases a range of aberrant behavioral patterns may emerge in the later stages of the disease. These symptoms, known as behavioral and psychological symptoms of dementia (BPSD; Finkel *et al.*, 1996), tend to be episodic rather than progressive. They reflect a decreased well-being of the patient, impairment

*Correspondence should be addressed to: Jon Snaedal, Geriatric Department, Landspítali University Hospital, IS 101 Reykjavík, Iceland. Phone: +354 864 0478; Fax: +354 543 9818. Email: jsnaedal@landspitali.is. Received 11 Jul 2005; returned for revision 8 Sep 2005; revised version received 12 Dec 2005; accepted 12 Dec 2005.

in quality of life, and pose a heavy burden on the caregivers. BPSD are often the cause of referrals to a nursing home or of short periods of hospitalization. It has been argued that even modest benefits could improve the quality of life and may make the difference between living at home and institutionalization (Herrmann and Black, 2000). In the nursing home setting BPSD can put a severe strain on the staff as well as on other residents. Treatment is most often pharmacological and, as the prevalence of BPSD is high, many patients with dementia in the later stages are treated with sedatives, neuroleptics or antidepressants. This has caused widespread concern regarding the inappropriate use of psychoactive drugs in nursing homes (Talerico, 2002). Agitation and restlessness are two of the most disturbing symptoms of AD. The pharmacological treatment of agitation is usually by a neuroleptic drug but the result is insufficient in many patients and side-effects are common (Raskind *et al.*, 1987), even with the use of the newer atypical neuroleptics (Zarate *et al.*, 1997).

Non-pharmacological treatment options have received far less attention than pharmacological treatment, partly because of lack of reliable research. Research in this field is in most cases based on a very limited number of subjects or even on case reports. There is a great variability in non-pharmacological methods. In a review on non-pharmacological methods of intervention, Grässel *et al.* (2003) concluded that: “a fundamental evaluation of the therapeutic benefits of non-drug therapies in the treatment of dementia cannot yet be made.”

Music therapy is a type of non-pharmacological intervention. The therapy is based on the systematic use of tunes, sounds and movements. The therapist uses specific tunes or sounds or the inherent quality of sounds, which are produced in the sessions, to obtain the goals of the therapy in individuals with BPSD. Patients with AD are in most instances able to participate in music therapy and studies have suggested that their well-being increases (Clair, 1996). Music therapy also seems to increase interaction between individual patients and could therefore decrease their sense of isolation (Pollack and Namazi, 1992).

In this case-control study the effect of music therapy on BPSD in patients moderately severe and severe AD was evaluated.

Material and methods

Participants

Initially, 47 patients in the age range 71–87 years were recruited from two nursing homes and two psychogeriatric wards. At the time of the trial all of these patients had been diagnosed with AD according to ICD-10 and had moderate or severe dementia according to stages 5–7 on the Global Deterioration Scale (Reisberg *et al.*, 1982). Patients with other types of dementia were excluded. Written, informed consent was given by a close relative. Only one patient declined to

participate. The 46 remaining patients were then randomized to a music therapy group or a control group, with 23 individuals in each group. The dropout rate was significant as eight patients (17.4%) moved from the psychogeriatric ward to a nursing home ($n = 5$), deteriorated ($n = 2$) or died ($n = 1$). Thus 38 patients were able to participate in all of the sessions and were evaluated: 20 in the music therapy group and 18 in the control group. The study was approved by a bioethics committee and registered by the Central Data Commission in Iceland.

Evaluation

After inclusion in the study all the patients BPSD were rated according to the Behavior Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD; Reisberg *et al.*, 1987) after interview with the nursing staff. The scale has been translated into Icelandic and validated (Haraldsson and Snaedal, unpublished). Two nurses were trained in using the BEHAVE-AD scale and they were blinded to the therapy used. The nurses were not part of the staff of the wards. The same nurse evaluated each patient throughout the study.

The therapy group received 18 sessions of music therapy, each lasting 30 minutes, three times a week for 6 weeks but the control group had no change of care. After 6 weeks of the study all the patients were rated for the second time, and after 10 weeks for the third time when the therapy group had not received any music therapy for 4 weeks. Throughout the study the same qualified music therapist (H.B.S.) conducted the music therapy.

Music therapy

Three or four patients participated in each session. A collection of songs, familiar to elderly Icelanders, was selected initially by the music therapist and used throughout the study. A selection of these songs was then chosen by the group and the therapist and each song was sung twice. Those patients not actively participating sat with the others holding the songbook and listening. In that way every patient participated actively or passively and it therefore was possible to include patients in different stages of dementia in the same sessions. In between the songs the patients chatted with each other or with the therapist.

In the sessions the patients and the therapist sang, accompanied by a guitar (the therapist) and various kinds of instruments (the patients) of their choosing. Initially, many of the patients were reluctant to use the instruments but subsequently they joined in with the others and seemed to enjoy the session. The instruments were also used for improvising with or without a theme. Sometimes the patients had an urge to move and dance in harmony with the music and that was allowed freely.

Statistical analysis

As we did not anticipate normal variation in these small groups we used the Wilcoxon signed rank test. However, the results were the same using the *t*-test (data not shown here).

Results

Most of the patients had been stable regarding their dementia for the past 3 weeks. The most prevalent symptoms rated by the BEHAVE-AD were activity disturbances and paranoid and delusional ideation. Some other symptoms were infrequent such as hallucinations and diurnal rhythm disturbances. In Table 1 the scores of the subscales of BEHAVE-AD are shown, as well as the total score in both groups. After 6 weeks, there was a significant decrease in symptoms rated as activity disturbances in the therapy group ($p = 0.02$) but not in the control group ($p > 0.5$) (Figure 1). This effect decreased during the next 4 weeks without therapy and was not significantly lower than at the start.

There was a non-significant decrease in the total points of the BEHAVE-AD in the therapy group after 6 weeks of music therapy ($p = 0.3$) and a smaller and non-significant decrease in the control group ($p > 0.5$) (Figure 2). Further decrease in total points during the next 4 weeks in the control group was mainly due to changes in one patient. There was no decrease in symptoms rated in other subscales of the BEHAVE-AD, neither in the therapy nor in the control group.

When three of the seven categories of the BEHAVE-AD (activity disturbances, aggressiveness and anxiety) were put together, there was a significant reduction in symptoms in the therapy group ($p < 0.01$) but not in the control group ($p = 0.5$) (Figure 3).

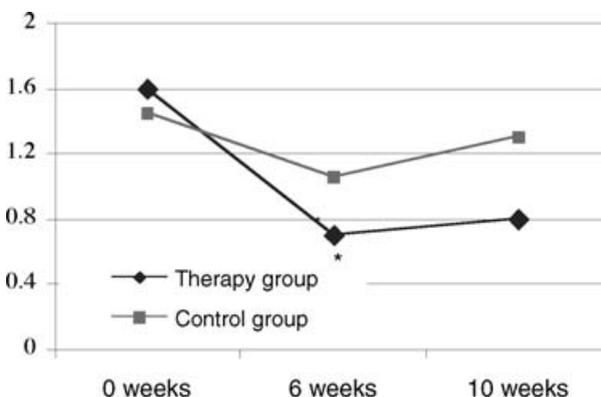


Figure 1. Average scores for activity disturbance on the BEHAVE-AD. * $p < 0.05$.

Table 1. Scores on the BEHAVE-AD

	THERAPY GROUP				CONTROL GROUP			
	N	BEFORE TREATMENT (MEAN)	AFTER TREATMENT (MEAN)	FOUR WEEKS LATER (MEAN)	N	BEFORE TREATMENT (MEAN)	AFTER TREATMENT (MEAN)	FOUR WEEKS LATER (MEAN)
Paranoid and delusional ideation	20	1.4	0.8	1.0	18	0.7	1.0	0.7
Hallucinations	20	0.3	0.2	0.2	18	0.7	0.05	0.05
Activity disturbance	20	1.6	0.7	0.8	18	1.4	1.0	1.3
Aggressiveness	20	0.7	1.2	1.1	18	1.3	1.3	0.8
Diurnal rhythm disturbances	20	0.3	0.1	0.2	18	0.3	0.4	0.2
Affective disturbance	20	0.3	0.6	0.5	18	0.5	0.4	0.1
Anxieties and phobias	20	1.0	0.7	0.8	18	0.2	0.4	0.3
Total score	20	5.5	4.4	5.0	18	5.4	4.7	3.5

BEHAVE-AD = Behavior Pathology in Alzheimer's Disease Rating Scale.

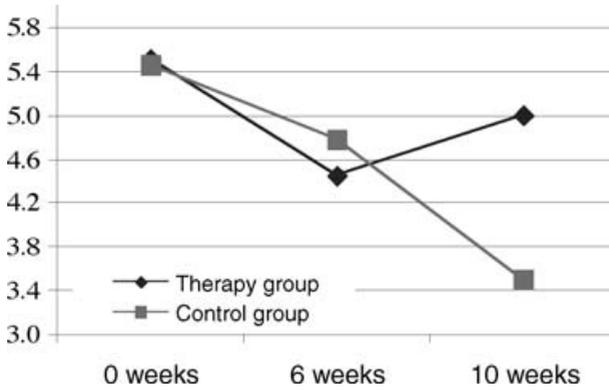


Figure 2. Average total scores for the BEHAVE-AD.

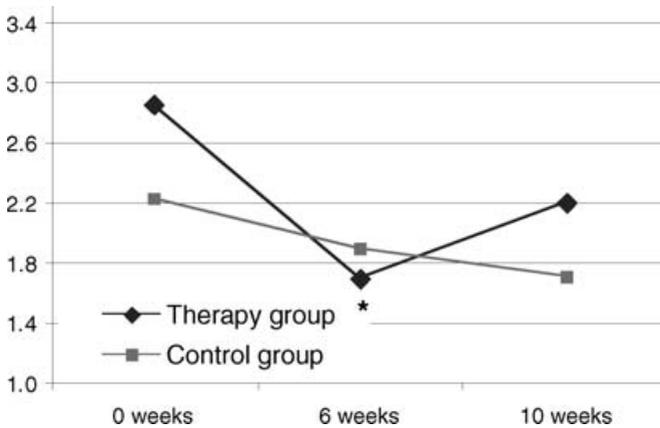


Figure 3. Average scores for activity disturbance, aggressiveness and anxiety on the BEHAVE-AD. * $p < 0.05$.

The benefits of the music therapy had disappeared 4 weeks after the last session according to all ratings.

Discussion

Music therapy is one of the non-pharmacological methods used in the treatment of BPSD (Grässel *et al.*, 2003). Theoretically, active participation in music sessions could give some meaning to the lives of patients who have lost the ability to create meaningful activity. Their desire for activity would subsequently be met and symptoms of meaningless activities lessened. Anxiety, which is often the result of the patient's difficulties in identifying their surroundings, could also be a target symptom of music therapy. However, it would be difficult to argue that

symptoms most likely based directly on organic changes such as hallucinations and misidentification should benefit from this kind of therapy.

A number of studies on the use of music therapy in the later stages of dementia have been published. A study using group singing in a group of 10 patients found a significant change in behavior after treatment sessions but there was no control group (Olderog-Miller and Smith, 1989). A study using a crossover design on 39 individuals with agitation and severe cognitive impairment showed a significant reduction in agitation during and following an individualized compared to a classical music session (Gerdner, 2000). Music therapy has been used as treatment of depressed mood in older individuals without dementia (Hanser and Thompson, 1994; Suzuki, 1998) as well as with dementia (Ashida, 2000). Only a few studies have been conducted using quantitative measures of the effects of music therapy. One is a case-control study on the effects of music therapy sessions on cognition and behavior, which showed significant improvement in cognition measured by the Mini-mental State Examination, but there was no effect on behavior (Van de Winckel *et al.*, 2004).

Our study shows that one of the target symptoms of music therapy, activity disturbances, can be affected positively by repeated sessions for 6 weeks. Furthermore, when the scores of the subscales measuring activity disturbances, aggressiveness and anxiety were compiled, there was a significant change in the therapy group. Other symptoms remained unchanged. The effect had diminished 1 month after the therapy was stopped.

The strength of this study is the design as it is single-blinded and placebo-controlled, with comparable groups at baseline. The study included only patients with AD, other dementias being excluded. By having the same qualified music therapist for all patients and the same trained nurses as raters, possible interrater differences were avoided.

The limitations of this study are the small size of the sample and the dropout ratio of 20%, which can be expected in this vulnerable patient group. The therapy *per se* was not the reason for any dropout. Furthermore, only a few of the patients had substantial symptoms as rated by the BEHAVE-AD, the others had only moderate or minor symptoms. The therapy was therefore not likely to show a significant change in symptoms in some of the subscales of BEHAVE-AD because of floor effect. The most prevalent symptom, activity disturbances, showed a significant decrease in the therapy group as opposed to the control group. It has to be considered that this study showed an effect using only one type of music therapy, the active participation of the patient along with the therapist, both with instruments and by singing. The study did not address other types of music therapy such as passive listening or singing. There was also no comparison between different types of music.

One of the advantages of music therapy is the seeming lack of side-effects. Another advantage could be an increased interest on behalf of the staff in caring for and treating the patients, which might decrease the high turnover of staff in this kind of care.

The results of this study thus support the findings of many other studies and case reports that activity disturbances and anxiety can be affected by the patient's participation in music therapy. There is, however, a need for comparison of music therapy and pharmacological therapy in BPSD.

Conflict of interest

None.

Description of authors' roles

H.B.S. organized and conducted the music therapy in the groups. J.S. was the supervisor of H.B.S., organized the study and had the clinical responsibility. Both contributed to writing the manuscript but J.S. wrote the final version as well as the revision after the first author's death.

Acknowledgments

The authors thank Gerdur Johannsdottir who was trained in the use of BEHAVE-AD and carried out the ratings. Thanks are also due to the late first author's husband, Arni Stefansson, who was helpful in managing the statistics as well as representing his wife in this process after her death. The work of H.B.S. was funded by the Research Fund for Alzheimer's Disease and Related Disorders, Landspítali University Hospital.

References

- Ashida, S.** (2000). The effect of reminiscence music therapy sessions on changes in depressive symptoms in elderly persons with dementia. *Journal of Music Therapy*, 37, 170–182.
- Clair, A. A.** (1996). The effect of singing on alert responses in persons with late stage dementia. *Journal of Music Therapy*, 33, 234–247.
- Finkel, S. I., Costa e Silva, J., Cohen, G., Miller, S. and Sartorius, N.** (1996). Behavioral and psychological signs and symptoms of dementia: a consensus statement on current knowledge and implications for research and treatment. *International Psychogeriatrics*, 8 (Suppl. 3), 497–500.
- Ferdner, L. A.** (2000). Effects of individualized versus classical relaxation music on the frequency of agitation in elderly persons with Alzheimer's disease and related disorders. *International Psychogeriatrics*, 12, 49–65.

- Grassel, E., Wiltfang, J. and Kornhuber, J.** (2003). Non-drug therapies for dementia: an overview of the current situation with regard to proof of effectiveness. *Dementia and Geriatric Cognitive Disorders*, 15, 115–125.
- Hanser, S. B. and Thompson, L. W.** (1994). Effects of music therapy strategy on depressed older adults. *Journal of Gerontology*, 6, 265–269.
- Haraldsson, S. and Snaedal, J.** (2006). Behave-AD, validation in Icelandic of a quantitative scale on behavioral and psychiatric symptoms in dementia. Manuscript submitted for publication.
- Herrmann, N. and Black, S. E.** (2000). Behavioral disturbances in dementia, will the real treatment stand up? *Neurology*, 55, 1247–1248.
- Olderog-Millard, K. A. and Smith, J. M.** (1989). The influence of group singing therapy on the behavior of Alzheimer's disease patients. *Journal of Music Therapy*, 26, 58–70.
- Pollack, N. J. and Namazi, K. H.** (1992). The effect of music participation on the social behavior of Alzheimer's disease patients. *Journal of Music Therapy*, 29, 54–67.
- Raskind, M. A., Risse, S. C. and Lampe, T. H.** (1987). Dementia and antipsychotic drugs. *Journal of Clinical Psychiatry*, 48 (Suppl. 10), 16–18.
- Reisberg, B., Borenstein, J., Salob, S. P., Ferris, S. H., Franssen, E. and Georgotas, A.** (1987). Behavioral symptoms in Alzheimer's disease: phenomenology and treatment. *Journal of Clinical Psychiatry*, 48 (Suppl.), 9–15.
- Reisberg, B., Ferris, S. H., De Leon, M. J. and Crook, T.** (1982). The global deterioration scale for assessment of primary degenerative dementia. *American Journal of Psychiatry*, 139, 1136–1139.
- Suzuki, A. I.** (1998). The effects of music therapy on mood and congruent memory of elderly adults with depressed symptoms. *Music Therapy Perspectives*, 16, 75–80.
- Talerico, K. A.** (2002). A critique of research measures used to assess inappropriate psychoactive drug use in older adults. *Journal of the American Geriatrics Society*, 50, 374–377.
- Van de Winckel, A., Feys, H. and De Weerd, W.** (2004). Cognitive and behavioral effects of music-based exercises in patients with dementia. *Clinical Rehabilitation*, 18, 253–260.
- Zarate, C. A. et al.** (1997). Risperidone in the elderly: a pharmacoepidemiological study. *Journal of Clinical Psychiatry*, 58, 311–317.