Trauma: An Interim Analysis of Trial Efficacy in a Pilot Study Investigating the Effects of Music Therapy in Ventilated ICU Patients

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Background

Music Therapy (MT) is quickly becoming a standard of care to reduce patient distress and promote emotional, psychological, and psycho-social well-being in the medical field. The recovery of patients suffering from traumatic injuries in an ICU setting is often complicated by noxious stimuli. Pharmacologic sedation is used for over 80% of ICU patients to relieve the disconcerting feelings that are a result of their surroundings. MT is frequently used in hospitals, but its effects on the sedation requirements of critically ill patients in an ICU has not been previously studied. MT holds the potential to reduce the patient's sedation, ventilator time, hospital stay length, and to decrease the possibility of potential mortality.

Retrieved from http://medchrome.com/minor/anaesthesia-minor/mechanical-ventilation-of-lungs/ (2009).

Methods

Study Goals: To show a change in pharmacological sedation requirements when patients are exposed to MT as compared to a rest period
Study Location: Lehigh Valley Health Network Cedar Crest TNICU, Allentown, PA, USA
Study Demographic: 27 participants enrolled in a 2.5 year period
Inclusion Criteria: 18 years of age or older; admitted to the TNICU; trauma related injuries; required assistance of mechanical ventilation including: full-vent support, trach, C-Pap and Bi-Pap, trach Mask; Glasgow Come Scale (GCS) of 9 or above for 24 hours prior to enrollment; required intermittent sedation, able to understand and sign the informed consent form (ICF) or have a legally authorized representative (LAR) who can provide the ICF.; music preference known by family at the time of consent
Exclusion Criteria: Presentation of neurological deficit with a GCS less than or equal to 8; radiologic evidence of severe head injury with a GCS less than or equal to 8; continuous sedation that required propofol, pentabarbital, or paralysis; diagnosis of dementia; known hearing impairment of use of a hearing aid; music preference was not known; the individual required the support of mechanical ventilation indefinitely
Experimental Set-up: Music therapy and undisturbed rest periods were given on alternating days until the end of therapy. Each session of MT and RP lasted one hour and was administered twice per day at a minimum of five hours apart. Music was delivered by the bedside nursing staff via Mp3 player devices with headphones. Music selection was determined by patient preference or the LAR from a researcher-provided music library.

Results

Subject ID	Total Days on MT	Total Sedation in mcg/ml	Total Days on Non MT	Total Sedation in mcg/ml
DSP18	1	50	1	0
M-M19	5	14,000,200	9	30,002,000
EWB33	6	500	11	200
M-R25	4	1300	11	12,002,500
DAS69	8	1000	9	1200
LMK69	1	300	2	800
A-Z28	4	2000	4	2000
CLS48	6	1700	12	2400
T-H64	1	700	2	700
RAM23	4	1000	5	1200
G-K51	1	800	2	400
GTM75	7	3,001,100	6	1400
V-S27	3	1700	3	1950
D-B51	2	400	2	300
RHD51	2	0	3	0
ASF46	2	100	6	1700
EG33	3	500	3	750
SLM19	2	1500	8	1500
J-L40	5	0	11	50
B-W45	3	125	3	0
CPM40	2	0	3	0
BDS61	3	0	6	0
R-C65	1	400	4	325
	76	**17,015,375**	**117**	**42,021,375**
JPV70	N/A	**Average Amount of Sedation per day on MT**		**223886.5132 mcg/ml**
LCR28	N/A	**Average Amount of Sedation per day on Rest Per**		**359157.0513 mcg/ml**
GJM66	N/A			
TGS37	N/A	**62.34% more sedation required on Rest Period days**		

Figure 1. The graph pictured above shows the subject ID, distribution of days enrolled in the study, and total pharmacological sedation administered on MT days versus rest period days per subject. The subject IDs in the lower left corner were not relevant when analyzing data due to factors such as not having enough days of enrollment, etc. The bolded boxes in the lower right show the total amount of sedation administered to the entire patient population and the difference in sedation needed on rest period days averaged as a whole population.

Identification	Sedation initial (mcg)	Sedation final(mcg)	Sedation change(mcg)
DSP18	50	200	-150
BDS61	0	0	0
M-M19	3,000,325	0	3,000,325
EWB33	500	0	500
M-R25	600	0	600
DAS69	0	0	0
R-C65	300	25	275
D-B51	0	200	-200
RHD51	0	0	0
ASF46	100	100	0
LMK78	0	0	0
A-Z28	400	100	300
CLS48	700	0	700
T-H64	0	200	-200
RAM23	200	0	200
E-G33	100	450	-350
SLM19	1500	0	1,500
G-K51	2450	500	1,950
J-L40	0	0	0
GTM75	0	0	0
CPM40	0	0	0
B-W45	100	0	100
V-S27	600	600	0

Figure 2. The table above shows the enrolled patients and their change in sedation from the first day of study enrollment and the last day of study enrollment. The final column shows the net change in pharmacological sedation requirements between the two days.

Discussion

It was hypothesized that the amount of sedation required would decrease on the days that MT treatment was received, and would increase on days when the "rest period" was received. The results showed that across the study population, patients required 62.34% more sedation on rest period days than on music therapy days.

All of the previous studies limited the amount of time that patients received MT to 30 minutes per day. The patients enrolled in this study received two 60 minute sessions of MT each day. Each patient received 1.5 hours more MT than the other studies, which is something that aided in determining the efficacy of MT. Sample size was a noticeable limitation in this study; originally the study planned to enroll 100 patients.

Although a goal of the study was to achieve more heterogeneity in sample population, limiting the patient pool to TNICU patients was a possible cause for problems with patient accrual. In future studies, all patients in a critical care setting should be included in MT studies (TNICU, MICU, SICU). This would create an ideal population, as the majority of TNICU patients are of a younger age, and MICU/SICU patients trend towards more advanced ages on average.

Conclusion

The results of this study clearly showed that Music Therapy plays a key role in reducing sedation for patients. Reduction of sedation would cause a lowering of ventilator time and expedited discharge from the TNICU/ICU. Further research should be conducted to investigate the effects of music choice on the patient's sedation requirements. Numerous studies have shown the effects of MT on patient heart rate and respiratory rate, and lyrics are known to have effects on mental status. No research has been conducted to determine whether music without lyrics or music with a low beat per minute number can lower sedation requirements still further.

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