

Relationship between the Characteristics of Goat Therapy, Music Therapy and Naming Therapy

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ABSTRACT

Objective: Goat therapy, music therapy and naming therapy is widely used and recognized for the medical benefits.

Design: A clinical study.

Materials and Methods: We analyzed effect of goat therapy, music therapy and naming therapy.

Results: Many of the patients had experience interacting with therapy goats and were interested in and favorable toward interacting with the stationed therapy goats. Accelerated plethysmography (APG) revealed that low frequency (LF) and LF/high frequency (HF) ratio decreased after enjoying classic music. The patient having a deficit of specific phonological function successfully responded to phonological therapy without any efficacy in semantic therapy.

Conclusions: Our study suggested that the combination of goat therapy, music therapy and naming therapy is important.

KEY WORDS

goat therapy, elderly care house, preschool child, naming therapy, music therapy

INTRODUCTION

Therapy goats offer companionship and unconditional love which can serve as a lifeline for those with little else to live for, such as patients fighting terminal illnesses, or patient feeling hopeless¹⁻⁵⁾. One hospital, the Laguna Honda Hospital and Rehabilitation Center in San Francisco, even houses their therapy goats full-time in a farm setting so the therapy goats can work with patients long-term^{5,5-10)}. The spiritually enriching effects of spending time together with goats are gaining the recognition from the public^{5,7,10-21)}.

Research on the action to the body of music has already begun in the 19th century⁵⁻¹⁰⁾. It has already known in the 19th century that metabolic increase, the muscle power increase with music. Music changes blood pressure, breathe, the pulse, and various sense thresholds^{1,7,10-19)}. Music brings the change and the conversion of the behavior. Music gives the stimulus to the intellectual and fantastic side¹⁹⁻²⁴⁾. Music does the change of the feeling to uplifting or sedative, Music influences a mentality side and a physiology side^{1,25-36)}. Music is sometimes used to ease a strain before examination^{2,24,36-46)}. There is much good influence of music from the viewpoint of the music therapy^{5,7-10)}. Music tunes & awakes patient soul. For music therapy, the music to use patients is bet-

ter to match individual patients^{4,6)}. Recently music therapy is sometimes on spot light. Music brings joy and relaxation to patients, particularly when they are stressed¹⁻⁴⁾. In the operation and rehabilitation room, we use the background music. Sympathetic nervous system activities were decreased with music. When rehabilitation is done, classical music and Japanese ballad Enka are expected additional effect on rehabilitation^{1,2-6)}.

The human brain understands the speaker's real intentions for verbal acts. Our brain is a highly adaptive learning device, reorganizing itself in accordance with environmental constraints^{2,8-12)}. Intelligibility assessment is a hallmark of aphasic assessment. Anomia is main problem of all aphasics of cerebral vascular disorder patients. Anomia is almost accepted by all aphasics^{2,47-56)}. It is one of a representative symptom. However, it is often that hypergasia of many elements repeats as for the aphasia^{2,3-8)}. There are many cases that it is distress to judge which system catches a disorder simply. In approach of cognitive-neuropsychology for aphasia, we will simulate language information processing, and assumes a problem system according to a specific function^{2,3-8)}. If a single subsystem was damaged, it is easy to make a hypothesis of a specific dyscrasic base, and can expect appropriate treatment.

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MATERIALS AND METHODS

Goat therapy: The subjects were elderly hospitalized in the elderly nursing home, disabilities hospitalized in the disability services, elementary school and high school students and preschool children with no fear of companion goats, who had consented to the survey. They can interact with the therapy goats. Tokara, Alpine, Saanen, Shiba and Korean therapy goats (age under 11 year-old) were used. To determine the effect of goat therapy, all goats were stationed under specialist handler. All experimental protocols follow the Guidelines of Animal Use and Care of the National Institutes of Health.

We investigated changes in the status when interacting with the therapy goats. During the interaction, they desire the interaction spend time freely with the goats. First, we conducted hearing survey with them who had desired participation in the interaction in advance.

Music therapy: The subjects were young 1 man and 19 women. Mean age at examination was 21.8 ± 0.4 years. They enjoyed classic music CD with head phone. Classic music was Chopin: Nocturne, Op. 9-1, Remo Giazotto (Albinoni): Adagio and Vivaldi: four seasons-spring Allegro. They enjoyed classic music for 2 min and 40 sec. They were measured APG last 2 min and 20 sec. APG was performed using a pulse-meter (Artett C, U-Medica, Osaka, Japan) with the sensor positioned on the tip of the ventral side of the right index finger. Heart-rate variability (HRV) was determined in all subjects using the spectral analysis. Fast Fourier transform (FFT) LF and HF component powers and LF/HF ratio were determined. We investigated under a controlled physical condition and living environment. The room temperature and humidity were 26°C and 65%. Probability values of 0.5 or lower were regarded as statistically significant in all tests. Statistical analysis was performed using Statistical Package for the Social Science (SPSS) 18.0 J software (SPSS Japan Inc., Tokyo, Japan).

Naming therapy: The subjects were 3 cases of pure anomia in the chronic stage with comparable mechanisms. Their symptoms and responsible neural resources were different.

Case 1: A 59-year-old woman was suffered from cerebral infarction. She was no Wernicke's aphasia but middle transcortical sensory aphasia, and crossed aphasia. Raven's Colored Progressive Matrices (RCPM) was 17/36, and Wechsler Adult Intelligence Scale (WAIS-R): Intelligence Quotient (PIQ) was 45. Comprehension deficit is mild. She has not phonologic errors by confrontation naming, and much allied of a semantic paraphasia as "cat" → "dog". The errors of the same quality on understanding (poor judgment between "a cat" and "dogs"), and shows degradation by meaning evaluation of synonym judgment. The semantic deficits were suggested.

Case 2: A 65-year-old man was suffered from cerebral hemorrhage. He was mild anomia, (RCPM30/36, WAIS-R PIQ86). Comprehension is almost good. As for the naming, there was much self-modification in verbal paraphasia dominance. For example "It is not orange ... but strawberry ... pineapple?" Roundabout remark and explanation held most. Semantic understanding does normal, and there were no phonological errors. It was thought with a disorder of word retrieval; Phonological output Lexicon. He added a word and verification training of a picture as semantic / vocabulary therapy.

Case 3: A 69-year-old man was suffered cerebral hemorrhage. He exhibited mild motor aphasia and Broca's aphasia. Understanding is good, and Phonological errors which were displacement or abbreviation occur frequently by confrontation naming. However, forms of words were collected and can suppose aim word ("ringo" → "ringa"). He showed the same error even if wrote it. We supposed that a phoneme was not collected precisely (Phonological output buffer disorder).

After administering a confrontation naming task including 60 words, the words that the patients failed to name were classified into 2 sets. We administered both semantic and phonological therapies using these 2 sets of words for 2 months and measured the average number of correct answers before and after therapy.

The present study conformed to the provisions of the declaration of Helsinki in 1995 (as revised in Edinburgh in 2000)¹⁻⁵.

RESULTS

Goat therapy: Longest Longevity of our therapy goats were more than 11 years old. Most of our therapy goat mother born 14 children. White daughter F1 hybrid backcross with Tokara father goat (white) bore white grandson and black granddaughter BC1 hybrids just 8

months after her birth. Korean black goat bore F1 hybrid white female and male when father was 2 year and 6 month-old. Then Korean black goat bore additional 2 white F1 hybrid goats when father was 3 year-old. Then Korean black goat bore additional 2 white F1 hybrid goats when father was 3 year and 6 month-old. 7 month-old Alpine (black and white) goat bore white daughter F1 hybrid when father was 4 year-old. Any breed of therapy goat can be a therapy goat of rehabilitation.

High school students gave the food to therapy goats, met therapy goat's new birth and therapy goat's parenting. Elderlies hospitalized in the elderly nursing home and its stuffs hugged baby therapy goat and gave the artificial milk. This baby therapy goat became very friendly to patients and stuffs. Therapy goat owners treated their goats in animal hospitals. Some of them communicated with their therapy goats. Some of them did a formal ceremony as human at the time of a goat death and visited the grave at the special days with children and their friends. Many of the patients had experience interacting with goats and were interested in and favorable toward interacting with the stationed goats in the short term. Interaction with goats in schools appears to have potential as a means for promoting mental health education. In care and welfare facilities for the aged, goat-assisted activity is actively encouraged to improve the elderly residents and rehabilitation users and stuffs. Some elderly residents became the ownership of therapy goats. The therapy goat increased mood effect. Elderlies hospitalized in the elderly nursing home, disabilities hospitalized in the disability services, elementary and high school students and preschool children got great experiences with the therapy goats. Therapy goat activates the appetitive system in the children and, thus, causes an arousal or excitement related to increased motivation and concentration to go the school. The elementary school children hugged the baby therapy goats and got the milk from mother therapy goats and gave milk to baby therapy goats. In addition, this creates a new economic niche for a number of the lemon producing farmers with therapy goats.

Music therapy: HF increased after enjoying classic music. These results suggest that parasympathetic activities increase width of peripheral vein and venous oxygenation index (VOI) after enjoying classic music. LF and LF/HF ratio significantly decreased after enjoying classic music ($1536 \pm 1054 \rightarrow 741 \pm 414 \text{ ms}^2$ ($p < 0.001$), $2.463 \pm 2.15 \rightarrow 1.139 \pm 1.11$ ($p < 0.001$), respectively). These results suggest that sympathetic activities decreased after enjoying classic music. After enjoying classic music psychological stress decreases and makes relaxation effect.

Naming therapy: Case 1: Before our therapy, the average correct answer rate was 13% in the semantic therapy words, 20% in the phoneme therapy words and 23% in non-training words. Those improved 63%, 50%, and 34% respectively after 2 month therapy. Those became 60% and 43% about 2 months after our therapy. Our therapy had excellent than conventional multi modal therapy. The effect of therapy was continued about 2 months after our therapy. Her average correct answer rate of the semantic therapy words improved more than that of phoneme therapy words. The semantic therapy had a long training effect than phonological therapy.

Case 2: Before our therapy the average correct answer rate was 33% in semantic therapy words, 17% in the phoneme therapy words, 25% in semantic / vocabulary therapy words and 17% in non-training words. Those improved 42%, 75%, 83% and 41% respectively after our therapy. The meaning training did not improve it. However, the vocabulary training and the phoneme training were effective.

Case 3: Before our therapy, the average correct answer rate was 50% in the semantic therapy words and 50% in the phoneme therapy words. About 2 months after our therapy, there was no change in semantic therapy (correct answer rate was 47%). On the other hand, the phonological therapy improved it very much (correct answer rate was 76%).

While the semantic training was more effective in the treatment of aphasia with specific semantic dysfunction, the phonological therapy did not show any efficacy. In contrast, the patient having a deficit of specific phonological function successfully responded to phonological therapy without any efficacy in semantic therapy.

DISCUSSION

Therapy goats offer companionship and unconditional love which can serve as a lifeline for those with little else to live for, such as patients fighting terminal illnesses, or patient feeling hopeless^{1-5,46}. One hospital, the Laguna Honda Hospital and Rehabilitation Center in San Francisco, even houses their therapy goats full-time in a farm setting so the therapy goats can work with patients long-term¹⁻⁵. It can also

increase opportunities of socialization and exercise. Just watching therapy goats browse contently is a sight that paints a thousand words. The therapy goats indicated an important problem of humanity and well-being in therapeutic process^{1,2,24,25,28,44}. The husbandry practices, and, thus, depend on the level of care of the owner with regard the health and keeping conditions of the therapy goat will make better welfare. Those few moments that patients take from the daily busy schedule to just sit and play around therapy goats make a big difference. When patients see the beauty and greatness of the universe, and the awe-inspiring laws that govern it, patients reconcile to the fact that patients are part of nature and have infringement of natural laws¹⁻⁵. The whole combination of country life and annals just went so beautifully together that patients just resonate with it. Goat therapy is a real thing. For patients undergoing rehabilitative therapy, especially those associated with some sort of stigma such as alcohol or drug addiction, therapy goats offer non-judgmental affection and attention. One former alcoholic who hit "rock bottom" started working with therapy goats. This unconditional acceptance and support is the key factor for goat-assisted therapy. Therapy goats offer opportunities to communicate non-verbally, a chance many affected patients seize wholeheartedly-and which, happily, often lead to increased verbal communication.

Therapy goat ownership was reported to significantly modify the relationship between social support and the change in psychological well-being¹⁻¹². Therapy goats are still kept on small lemon producing farms in Hiroshima Prefecture¹⁻⁵. Goats are often used in hospitals, assisted living homes, nursing homes, schools, rehabilitation centers, hospices and other areas to help improve their well-being⁴⁻¹⁸. All of which are very beneficial to the patients¹⁹⁻²⁴. Most of the children who interacted with goats had experience interacting with goats and were favorable toward goats^{1,25-36}. It was a great learning experience for all^{2,24,36-56}.

Hiroshima prefecture as a leading representative of the lemon producing regions with goats promotes to raise the commercial value of the lemon for the fresh products market and food industry¹⁻⁵. The beneficial effects of the dietary lemon can be attributed not only to the vitamin C, essential oils and organic acids, but also to the antioxidant activity of their flavonoids. Recently, several studies highlighted lemon as an important health promoting fruit rich in phenolic compounds^{5,12,21,23}.

Therapy goats are still kept on small lemon producing farms¹⁻⁵. The epigenetic changes occurring in Post-Traumatic Stress Disorder (PTSD) and their contribution towards understanding the etiology, prevention and treatment of PTSD. Children had a day at the farm to leave all their troubles behind and to just experience the joy of goat therapy. The therapy goats have healed from PTSD of various abuses or neglect. Patients resumed their regular visitation and particularly the therapy goat fawns triggered great interest and empathy. Patients interact with the therapy goats spontaneously stroking, brushing, feeding therapy goats with herbs from outside the enclosure. Therapy goats are a popular feature in many elementary schools. Therapy goats can be very effective for formal instruction in science and other subjects and for teaching humane attitudes and values, and can interest and motivate children with learning problems and other difficulties. Goat therapy is officially trending on college campuses nationwide¹⁻⁵. Dozens of universities have hosted goat therapy events, promising students a chance to unwind with the therapy goats to help cope with the stresses of college life^{9,16}. Contracting lemon producing farmers allows patients regular goat contact at relatively low costs to the institution. In addition, this creates a new economic niche for a number of the lemon producing farmers. If patient give a therapy goat a name, it will learn to recognize that name and though it may not always come up to greet patient, it will turn its head and look at patient. Therapy goats try to catch our eyes when they need help. Therapy goats can communicate and interact with their human handlers. The therapy goats gaze toward the forward-facing person.

By pairing chromosomes of similar genomes, the chance for these recessive alleles to pair and become homozygous greatly increases, leading to offspring with autosomal recessive disorders^{10,11}. Although offspring of biologically related goats are subject to the possible effects of inbreeding, such as congenital birth defects, the chances of such disorders are increased. Introgression has been reported to cause the movement of a gene of an interspecific hybrid with one of its parents. Purposeful introgression is a long-term process⁹. Since it may take many hybrid generations before the backcrossing occurs⁹. Systematic inbreeding and maintenance of inbred strains is of great importance for biomedical research. The inbreeding guarantees a consistent and uniform goat model for experimental purposes and enables genetic studies. The use of inbred strains is also important for genetic studies to distinguish genetic from environmental effects.

Intense backcrossing is a pre-biotechnology breeding programme that can be used to create a near clone. By repeatedly backcrossing father to his daughter (F1) we can create an almost identical genetic twin of father. An intensive form of backcrossing where father is backcrossed to his daughter (F1), granddaughter (BC1) and so on, in order to maximize the percentage of father's genes in the offspring. 87.5% of great-granddaughter (BC2)'s genes would come from father^{13,25,39-43}. Inbreeding exposes recessive alleles through increasing homozygosity. Many of the traits that affect profitability in crosses of modern dairy breeds have not been studied in designed experiments.

Epigenetics is a potential interventional target in finding the pathogenesis, treatment and biomarkers for Alzheimer's Disease. Older patients, regardless of gender, health, wealth, or education, showed the survival advantage of goat therapy. The benefits of therapy goat include a longer life¹⁻². Therapy goat not only introduces some interesting ideas and characters, it also gives more years with therapy goat^{21,25,35,36}. Apart from that, there is a very strong tone in the message being sent how to coexist peacefully with therapy goats.

We have to show compassion towards all living creatures. Therapy goats may be mute but we as a society have to speak on their behalf. No pain or agony should be caused to the therapy goats. Cruelty to therapy goats causes psychological pain to them. Arrival of technology and its increasing utilization has also raised concern and controversies in ethical areas. Therapy goats breathe like us and have emotions. The therapy goats have a handful of feeding spots where they are provided with food. On walks, seeing two particularly friendly therapy goats — often makes our day. Therapy goat culling programmes are not sustainable nor acceptable from a welfare perspective. Feeding of therapy goats has been considered as a good deed.

An autoregressive approach to spectral analysis of HRV provides non-invasive indices of the sympathetic and parasympathetic functions^{21,25,35,36}. LF/HF is employed as a measure of sympathetic activity^{21,25,35,36}. HF decreases and LF/HF increases after psychological stressor. After enjoying classic music psychological stress decreases and makes relaxation effect.

We experienced three pure anomia cases of comparative disorder mechanism in chronic stage, and presents a result of the treatment that affiliation is cognitive-neuropsychology⁷⁻¹². Even if there is a little improvement in the training which is traditional multi modal therapy, appropriate training may let more improve even aphasia of chronic stage. Many researches were done in the field of the cognitive neuropsychology of language^{2,8-12}. Much of these researches have focused on spoken word production and its remediation in aphasia. As for case 1, semantics system was more impairment rather than a language. Therefore semantic therapy would be more effective. On the other hand, as case 2, the semantics kept, but retrieval of a word form was difficult. Therefore, a verification task and a rhyme cue which promotes retrieval of a word were effective to naming. As for case 3, semantic and retrieval of a word were possible. However, there was impairment to correct a phoneme to consist of it. Training such as the repeat which direct presentation made a phoneme was the most effective. In these results, depending on the dyscrasic mechanism of a case, effect of therapy was different. In clinical, we think that semantic therapy and phoneme therapy are not opposing concepts, but are that with which a patient should be provided as a complementary thing^{2,5-8}.

A world without therapy goats would be a very bleak one, and like all relationships, it's one we need to work on. Goat therapy is way to bind closely the normal interrelationship and thus facilitate the achievement of functional harmony and pathophysiological experiences. It's a tale of coexistence and survival. We investigated whether introgressive hybridization of Tokara goats can result in behavior changes and pathologic changes⁴¹. Nevertheless, just about any breed of goat can be a therapy goat¹⁻². Several previous studies have demonstrated that therapy goats play an important role in the regulation of disease pathogenesis⁶⁻⁸. In next study, effect of the combination of goat therapy, music therapy and naming therapy should be examined. To determine the combination of goat therapy, music therapy and naming therapy and explore the pathological mechanism, we suggest that further investigations are needed.

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