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Read the interview with Mr. Belli and Dr. Bittman - as they discuss the benefits of group drumming.

Interview - Impact on the Immune System (drumming strengthens the immune system)

COMPOSITE EFFECTS OF GROUP DRUMMING MUSIC THERAPY ON MODULATION OF
NEUROENDOCRINE-IMMUE PARAMETERS IN NORMAL SUBJECTS - 2001

Barry B. Bittman, MD; Lee S. Berk, DrPH, MPH; David L. Felten, MD, PhD; James Westengard, BS; O. Carl Simonton, MD; James Pappas, MD and Melissa Ninehouser, BS

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The study's principal investigator, Barry Bittman, MD, Neurologist, was interviewed by Remo Belli, founder of Remo Inc., the company that funded the project.

Mr. Belli – Dr. Bittman, would you begin by summarizing the principal findings of your study?

Dr. Bittman – Our project entitled, Composite Effects of Group Drumming Music Therapy on Modulation of Neuroendocrine-Immune Parameters in Normal Subjects presents, for the very first time, important scientific evidence documenting potential health benefits associated with a single group drumming session. Statistically significant increases in the activity of cellular immune components responsible for seeking out and destroying cancer cells and viruses were noted in normal subjects who drummed.

Mr. Belli – Would you discuss the relevance of your findings?

Dr. Bittman – Over the last few decades, leading medical scientists throughout the world have discovered many of the biological underpinnings of what has been termed the “mind-body connection.” Extensive medical research in animals and humans has revealed that what goes on in the mind clearly affects the body and visa versa. This inseparable connection is being studied by leading medical scientists exploring the mechanisms by which the immune system responds to and can be conditioned by what the individual is experiencing. In essence, an important aspect of health is reflected by a delicate balance that is constantly tweaked within us according to what we are experiencing. This contention is supported by a number of leading scientific investigations which have disclosed that the perception of stress negatively impacts the immune system, and in some instances, survival. Chronic stressors such as care giving for a loved-one with Alzheimer’s disease, marital separation and divorce, and examination stress in medical students appear to have a suppressive influence on many measures of immunologic reactivity. In a similar manner, heightened sense of control, nurturing, mirthful laughter and moderate exercise have been shown to boost key immune system components. Essentially, we set forth to determine whether or not group drumming could alter stress-related hormones and neural mediators, which would, in turn, produce a subsequent positive impact on cellular immunologic function. We asked ourselves whether or not group drumming had the potential to reverse specific negative biological effects associated with the classic stress response.



Mr. Belli – Dr. Bittman, would you explain what you’re referring to as the “classic stress response?”

Dr. Bittman – Certainly. The classic stress response refers to a series of predictable changes that occur within us when we are stressed. Simply stated, our perception of stress sets off key events that ultimately affect practically every organ system in our bodies. Brain centers responding to the perception of stress relay information to different organ systems that trigger specific responses by releasing a number of chemicals that affect us in many ways. Scientists sometimes refer to this as the “fight or flight response.” In one sense, it has a protective effect that enables us to fight or flee when the need arises. Yet this same response, even in the absence of threat, can lead to serious health consequences.

Mr. Belli – You mean like increased blood pressure?

Dr. Bittman – Precisely. Stress produces many negative physiological effects such as increased heart rate, muscle tension and gastric acid secretion. Yet biologically, there are other consequences that are often overlooked. A key to understanding the impact of the mind-body connection is the realization that stress also impairs immune function. While most people visualize immunity as the front-line defense against germs such as bacteria or viruses, medical scientists recognize another key role of our immune system_ seeking out and destroying cancer cells. Mr. Belli – Dr. Bittman, are you saying that there’s scientific evidence linking stress to cancer? Dr. Bittman – Yes, there’s a growing body of scientific research showing that our perception of stress can substantially diminish the activity of Natural Killer (NK) cells, specialized white blood cells that seek out and destroy certain cancer cells and viruses. A recent study published in the Journal of the National Cancer Institute by Dr. Barbara Andersen at Ohio State University demonstrated a precise correlation between perception of stress and NK cell activity in women who had recently undergone mastectomies. The women who were most anxious demonstrated the least NK cell activity and visa versa. Consistent outcomes have been observed in numerous highly regarded studies performed in animals and humans. Furthermore, reversal of chemotherapy effects have been demonstrated in animals stressed in laboratory environments.

Mr. Belli – How do such findings relate to your research?

Dr. Bittman – With these issues in mind, we specifically looked at NK cells. In addition, we measured the response of these cells to well-known substances that literally orchestrate immune function ... if you don’t mind the pun. They are called “cytokines” or “lymphokines.” The ones we measured were Interleukin II or IL-2 and Interferon Gamma, two of the strongest known promoters of NK cell activity. We also measured cortisol, DHEA and DHEA/cortisol ratios. These substances, released by the adrenal glands, are also known to affect immune function.

Mr. Belli – Based upon what you’re telling me, I suppose you knew which substances had to go up or down in order for drumming to be considered healthy. Were there any surprises?

Dr. Bittman – Frankly, yes. While we understood a basic framework for what would have to occur in order for drumming to move biology in a positive direction, we were surprised by the fact our preliminary studies didn’t turn out the way we expected. Cortisol, which predictably increases under stressful circumstances, went down in all of our trials as expected. Yet NK cell activity did not necessarily rise as initially expected when cortisol levels dropped.

Mr. Belli – Can you explain further?



Dr. Bittman – During our preliminary trials, we discovered there’s a considerable difference in the way people respond biologically to music. Essentially, it’s based on the fact that listening is quite different than performing. Research performed by our team in the past showed that listening to relaxing music while watching nature imagery clearly reversed the classical stress response. Yet when volunteers performed “basic” drumming, their immune systems didn’t automatically respond as expected. By “basic” drumming, we’re referring to a drum circle facilitated by an experienced individual who began each session with a short introduction describing what was about to occur during the session. After a series of trials and modifications of our initial protocol, we added specific techniques and drumming components aimed at relaxing subjects, enhancing camaraderie and promoting support within the group. Thereafter our findings began to reflect positive immune system changes.

The discussion between Remo Belli and Dr. Bittman continues with a focus on exploring the details of the drumming experiment, research conclusions, and insights for future investigations

Mr. Belli – Why did you perform preliminary studies, and how many subjects did you finally test?

Dr. Bittman – We performed an extensive series of preliminary investigations based upon the need to explore a variety of drumming approaches prior to the actual experiment. Our initial trials included 61 volunteers (9-11 subjects in each of 6 groups). These studies were used to identify the drumming strategy that demonstrated the best immunological promise for the actual experiment. Our final study included the results from the best response group and 50 additional subjects recruited for the actual study. The actual investigation therefore included data on 111 age and sex matched subjects, each of whom precisely met the criteria for inclusion into our study.

Mr. Belli – How do you know your findings did not come about simply from listening to drumming music or just the physical activity itself?

Dr. Bittman – This issue concerned our team from the start. We recognized the difficulty separating components that could ultimately produce positive immune system changes. In a preliminary study group using precisely the same investigative protocol, normal subjects were given the opportunity to listen to drumming music generated by another experimental group. Other groups drummed without introductory warm-up activities or drumming guided imagery that was ultimately incorporated into our final research protocol. One cohort performed intense drumming without these associated activities. No significant positive immunological changes were found in subjects from any of these groups.

Mr. Belli – Once you decided on your final drumming approach, how did things turn out?

Dr. Bittman – We essentially discovered statistically significant increases in NK cell activity, unstimulated and stimulated with cytokines for subjects who drummed compared to our control groups. It was also shown that cortisol was not a predictor of positive changes in NK cell activity. Increased DHEA/cortisol ratios, a measurement consistent with a positive effect approached statistical significance. Most importantly, we were able to successfully control for other biological changes that could have affected our results.

Mr. Belli – Dr. Bittman, how do you know that your findings did not occur by chance?



Dr. Bittman – While the findings I just described were highly significant from a statistical perspective, we also realized the need to control the actual experiment as tightly as possible to eliminate other factors that could come into play. Therefore, substantial efforts were expended to select our subject population and generate reproducible, reliable results. Participants were actually screened on two separate occasions. Individuals were excluded who reported active medical illnesses, or treatment for a medical problem. A history of heart or lung disease, hearing loss, pregnancy, or having missed the last menstrual period also precluded participation. Additionally, volunteers were eliminated who used prescription medications other than aspirin or birth control pills. Illicit drug use, cigarette or cigar smoking, tobacco chewing, and routine consumption of more than 2 alcoholic drinks/day within the last month served as criteria for exclusion. Subjects were asked (and signed a statement) not to consume alcoholic beverages, or to participate in sexual activity or aerobic exercise within a period of 24 hours prior to the experiment. All subjects refrained from eating for a minimum of 2 hours prior to the study. We also eliminated people if they drummed in the past, listened to drumming music on a regular basis, or participated in drumming within the past 3 months. All groups (experimental and control) were studied precisely at the same time of day, same day of the week and in the same setting. Samples were carefully handled by a team of experienced medical and laboratory personnel, and were analyzed at Loma Linda University School of Medicine, the University of Iowa, and our hospital, Meadville Medical Center.

Mr. Belli – If I may ask, why did you become interested in group drumming?

Dr. Bittman – Frankly, there are a number of reasons. An historical review disclosed that drumming as a healing ritual has been used for thousands of years by many civilizations throughout the world. Recently, there's been a strong resurgence of interest in drumming and drum circles, and how such activities can be used therapeutically in the medical setting. The Mind-Body Wellness Center, where we develop and offer whole person disease-based strategies, integrates musical approaches with traditional medical strategies. Drumming at our Center has evolved into an effective group intervention that is enjoyed on many levels. We're delighted to have scientific evidence suggesting it is truly beneficial from a biological perspective.

Mr. Belli – Have your impressions about drumming changed since performing the research?

Dr. Bittman – While I'm extremely pleased with our research findings, there's a part of me that's always known certain types of music move us in favorable directions biologically. From a physician's perspective, I've enjoyed the opportunity to watch group drumming rapidly evolve into a favorite activity for patients and healthcare professionals within our integrative programs. It seems we've merely added scientific credibility to what our patients have known all along. From a global perspective, our findings simply serve to validate the wisdom of the ancients.

Mr. Belli – Dr. Bittman, do you believe there's a lasting effect?

Dr. Bittman – Personally yes, but scientifically that's a great question. We deliberately performed a single intervention (one session per person) specifically to establish the greatest control possible. Testing humans is more complex than one might imagine-- especially over time. A lot can happen to a person in just 24 hours. Subjects in our study remained with us during the entire experiment. Therefore, we were able to eliminate many of the variables that might have occurred otherwise. While we realize it's impossible to control all potential variables in the long run, research by other investigators has shown that biology can be conditioned. We're looking forward to extending our hypothesis in order to investigate long-term effects.

Mr. Belli – How do you proceed from here? What are your next steps?

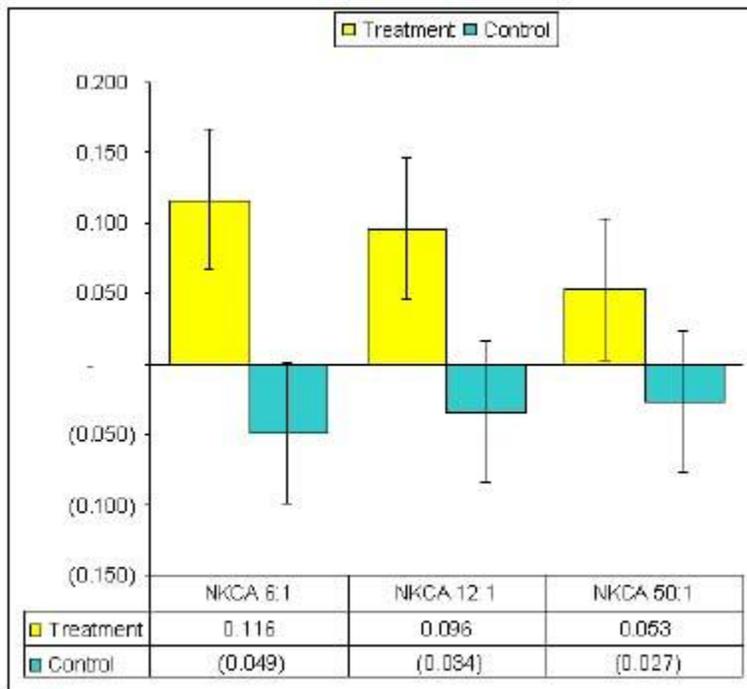
Dr. Bittman – Initially, I'm hoping our research provides the impetus for hospitals, clinics, rehabilitation centers, senior centers, nursing homes and insurers to integrate group drumming as a valuable intervention within traditional medicine. These organizations have an exceptional opportunity to incorporate a unique activity that combines proven health-promoting strategies including self-expression, group support, nurturing, exercise, stress reduction and of course, music making. We're also anticipating our study will encourage others to replicate these findings and build upon this knowledge base. Our plan to start at the bottom with normal subjects was chosen to establish a firm foundation for future studies. Recognizing the limitations of a single trial design, our next step is to extend our approach to individuals with cancer and other illnesses through the use of a similar protocol used repeatedly. A long-term strategy is also being considered.



Mr. Belli – One final question. Can you summarize what your team has learned that can benefit mankind?

Dr. Bittman – Group drumming in normal subjects enhances the activity of specific cellular immune components that are responsible for seeking out and destroying cancer cells and viruses. The degree to which such changes must occur in the context of disease control or prevention is yet unknown. While world-wide scientific attempts by leading investigators are in progress to develop effective approaches for boosting our innate immune system, many questions remain unanswered. Ultimately, such strategies may serve to favorably modulate the basic critical determinants of our health.

The following graph demonstrates changes in Natural Killer cell activity (NKCA) unstimulated and stimulated with Interleukin-2 and Gamma Interferon. The treatment group is represented by the yellow bars and the control group by the blue bars. All data shown is statistically significant, see p values below:



p<0.02; p<0.01; p<0.0000; p<0.002

Bittman B, Berk L, Felten D, Westengard J, Simonton O, Pappas J, Ninehouser M. Composite Effects of Group Drumming Music Therapy on Modulation of Neuroendocrine-Immune Parameters in Normal Subjects, *Alternative Therapies*, Jan 2001