

## IMPACT OF LISTENING TO CLASSICAL INSTRUMENTAL MUSIC ON CHOLESTEROL LEVELS IN INDIAN MEDICAL STUDENTS

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### Abstract

**Background:** Indian medical students go through various stressful situations during their academic life and in their future as well. This affects their well-being, their own health gets compromised in the process, which further causes disturbance in their normal body functioning. Music therapy can alleviate the stress they face and bring peace to their minds. It can also bring increased levels of biochemical parameters due to stress back to normal levels. The current study was conducted to investigate the results of giving music therapy to a small group of Indian medical students on their serum cholesterol levels. **Materials and Methods:** The study included sixty first-year M.B.B.S. students of Rajkiya Medical College, Jalaun (Orai), Uttar Pradesh, aged between 17-25 years. The ADSS questionnaire response and blood samples were taken from each subject in two stages, before and after music therapy. Raga Desi-Todi by the famed musician Pt. Hari Prasad Chaurasiya was used for the music therapy. **Result:** There was a significant difference in values of ADSS score for Anxiety ( $6.08 \pm 2.03$  v/s  $5.55 \pm 1.36$ ,  $p=0.0002$ ), Depression ( $5.87 \pm 1.28$  v/s  $5.55 \pm 1.11$ ,  $p=0.001$ ) and Stress ( $6.82 \pm 1.75$  v/s  $6.67 \pm 1.62$ ,  $p=0.002$ ). The statistical difference between the serum cholesterol values before and after therapy were significant (TG:  $168.12 \pm 17.70$  v/s  $166.55 \pm 14.92$ ,  $p$ -value: 0.014; HDL:  $39.13 \pm 9.08$  v/s  $40.35 \pm 8.39$ ,  $p$ -value: 0.009; LDL:  $140.79 \pm 9.84$  v/s  $137.37 \pm 9.98$ ,  $p$ -value: 0.001; TC:  $213.55 \pm 6.29$  v/s  $211.03 \pm 6.36$ ,  $p$ -value: 0.003). **Conclusion:** The findings of the current study suggested that listening to classical instrumental music can help in minimizing the stress and anxiety levels in Indian medical students and bring the cholesterol levels back to normal.

## INTRODUCTION

Indian medical students come across various life-altering situations during their academics, whether it is the transition from school life to college life, exposure to grave scenarios, deaths, illness, and to top all that, a difficult syllabus to learn. They come to terms with the fact that their one mistake can even lead to loss of a life. Also, in Indian households, being a doctor is seen as quite a noble profession, and every parent dreams of having a medico child in the family. This again puts a lot of pressure on medical students, who somehow pass through extremely hard entrance examinations and get in the medical colleges. They thrive hard to study and memorize everything so that they become a good doctor, and this takes a great toll on their health.

It is known that blood lipid dysfunctions are quite common in case of increasing mental stress and anxiety.<sup>[1]</sup> Psychological stress can affect certain human organs, important parameters and some physiological parameters. Physical stresses caused by physical works can affect cholesterol too. Few past studies have suggested that the serum cholesterol levels tend to rise whenever periodic examinations approach.<sup>[2,3]</sup>

There are several reasons for increasing stress and anxiety in Indian medical students but few of the most common ones are all related to their academic curriculum.<sup>[4]</sup>

Music plays a noteworthy part in relieving mind of its anguish. It is an easily attainable form of art and has an immediate effect on mind.<sup>[5]</sup> Studies have even

found the therapeutic effects of Indian classical music on stress and anxiety.<sup>[6]</sup> However, there was no prior studies which could describe the effect of music therapy using Indian classical instrumental music on rise in cholesterol levels in first year medical students, hence the present study was carried on.

## MATERIALS AND METHODS

### Participants

The present study was conducted in the Department of Biochemistry in Rajkiya Medical College, Jalaun (Orai), Uttar Pradesh. Sixty healthy, first year M.B.B.S. students of age 17-25 years were considered as subjects for the research. All the subjects were well-informed about the objectives of the study and a written consent was taken from each one of them. Students who were going through some treatment/medications, who had a dislike for any kind of music, students who had hearing impairment and those who suffered from excessive depressive disorders or anxiety were exempted from the study. Students were asked to fill up an ADSS questionnaire, created by Dr. Pallavi Bhatnagar et al.<sup>[7]</sup> The questionnaire comprised of questions based on daily life emotions and are related to anxiety, depression and stress.

The fasting blood samples were taken one day prior to the beginning of music therapy. Lipid profile was measured by serum concentrations of following parameters.

- Serum concentration of total cholesterol was estimated by the enzymatic CHOD-POD method.<sup>[8]</sup>
- Serum concentration of triglycerides was measured by the GPO-PAP method.<sup>[8]</sup>
- Serum concentration of high-density lipoprotein was evaluated by CHOD-POD/ Phosphotungstate method.<sup>[8]</sup>
- Serum concentration of low-density lipoprotein was calculated by using Friedewald's formula: LDL cholesterol = total cholesterol - HDL cholesterol - [triglycerides/5].<sup>[8]</sup>

**Music Intervention:** On the day of beginning of music therapy, the subjects were asked to report to the department at 8 am.<sup>[9]</sup>

They were made to sit in a properly ventilated and secluded study hall in the medical college. Two attendants were assigned to look after the intervention and sitting arrangement.

The subjects were asked to relax while sitting on their respective seats and keep their eyes closed while listening to the music.<sup>[10]</sup>

The Indian classical instrumental music 11 (Raga Desi-Todi by the famed musician Pt. Hari Prasad Chaurasiya) was played for the next half an hour at 50 to 60 DB.<sup>[11,12]</sup>

Subjects were asked to feel comfortable in approaching in case of any discomfort felt during the therapy. The ADSS questionnaire was refilled by subjects after one month. Serum cholesterol was measured again after the one month long therapy.

### Statistical Analysis

All the statistical data were studied and assembled using SPSS 21st version software by IBM USA. A p-value < 0.05 was considered as significant.

## RESULTS

The values of the ADSS score along with the biochemical parameters of both groups were compared with each other before the music therapy began.

[Table 1] shows the comparison of ADSS scores for subjects before music therapy and after music therapy. The p-values indicate there was a significant difference in Anxiety (6.08±2.03 v/s 5.55±1.36, p=0.0002), Depression (5.87±1.28 v/s 5.55±1.11, p=0.001) and Stress (6.82±1.75 v/s 6.67±1.62, p=0.002) after one month long music therapy.

[Table 2] displays that the statistical difference between the values of serum cholesterol before and after therapy is very significant (TG: 168.12±17.70 v/s 166.55 ± 14.92, p-value: 0.014; HDL: 39.13± 9.08 v/s 40.35± 8.39, p-value: 0.009; LDL: 140.79± 9.84 v/s 137.37± 9.98, p-value: 0.001; TC: 213.55± 6.29 v/s 211.03± 6.36, p-value: 0.003).

**Table 1: ADSS Questionnaire score values before music therapy and after music therapy**

	p-value	Mean		SD		SEM		t	N
		Before	After	Before	After	Before	After		
Anxiety (0-9)	0.0002**	6.08	5.55	2.03	1.36	0.26	0.18	4.00	60
Depression (0-9)	0.001*	5.87	5.55	1.28	1.11	0.17	0.14	3.49	60
Stress (0-9)	0.002*	6.82	6.67	1.75	1.62	0.23	0.21	3.23	60

\*\* very significant, \* significant

**Table 2: Serum cholesterol values before music therapy and after music therapy**

	p-value	Mean		SD		SEM		t	N
		Before	After	Before	After	Before	After		
TG (mg/dL)	0.014*	168.12	166.55	17.70	14.92	2.29	1.93	2.55	60
HDL (mg/dL)	0.009*	39.13	40.35	9.08	8.39	1.17	1.08	2.70	60
LDL (mg/dL)	0.001*	140.79	137.37	9.84	9.98	1.27	1.29	3.81	60
TC (mg/dL)	0.003*	213.55	211.03	6.29	6.36	0.81	0.82	3.13	60

\* significant, TG- Triglycerides, HDL- High density lipoprotein, LDL- Low density lipoprotein, TC- Total cholesterol

## DISCUSSION

The current study was administered to determine the result of music therapy using Indian classical instrumental music on cholesterol levels in first year Indian medical students. The ADSS questionnaire designed by Dr. Pallavi Bhatnagar et al was used as the preliminary step in finding the level of stress and anxiety in subjects.<sup>[7-10]</sup> It was seen that ADSS score values varied greatly after the subjects went through music therapy. The new responses were found to be more positive as compared to their previous responses to the questions in the questionnaire. This result was identical to the outcomes of study conducted by Prakash et al.<sup>[11-13]</sup>

Serum cholesterol was estimated before and after music therapy and it was found that the level of serum cholesterol was back to normal after the therapy using Indian classical instrumental music. This finding was similar to result of study conducted by Madhuri Sharma et al.<sup>[14]</sup>

## CONCLUSION

The result of the present study advocates the positive effects of using Indian classical instrumental music to bring the serum cholesterol values of stressed Indian medical students back to normal. However, more studies are recommended taking larger population in order to make a general policy for the betterment of medical students.

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