

# A study of serum HDL with respect to exercise and vitamin B3 supplementation at tertiary health care centre

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## Abstract

**Background:** Despite numerous therapeutic advances, cardiovascular disease (CVD) remains the leading cause of morbidity and mortality in world wide. Although statins reduce coronary artery disease by approximately 30% Aims and **Objective:** To study serum HDL with respect to exercise and vitamin B3 supplementation at tertiary health care centre. **Methodology:** This was a cross-sectional study carried out in the department of Medicine at tertiary health care centre during the one year period i.e. January 2017 to January 2018 in the patients who were having deranged lipid profile with HDL level low all the patients were prescribed exercises like walking at least for 45 min and at least 5 days in a week with oral supplementation of vitamin B3 with RDA (Recommended Daily Allowance) as a B-complex supplementation once in day for 6 weeks. The statistical analysis was done by unpaired t-test and calculated by SPSS 19 version software. **Result:** In our study we have seen that the majority of the patients were in the age group of 40-50 were 23.81%, followed by 30-40 were 22.22%, 20-30 were 19.05%, 50-60 were 20.63%, >60 were 14.29%. The majority of the patients were Male i.e. 61.90% and Female were 38.10%. At Baseline (n=63) the mean HDL-C level was (Mean±SD) - 32 ±3.45; 1month after intervention (n=61) - 33±4.12 there was increase after 1 month but not statistically significant (t=1.4672, df = 122, p>0.05). 6 weeks after intervention (n=59) the mean HDL-C level was - 41.23 ± 3.42 which was significantly higher as compared to baseline level (\* t=14.8294, df = 120, p< 0.0001) **Conclusion:** It can be concluded from our study that the B3 supplementation and exercise increased the HDL cholesterol level at one month but not statistically significant; at 6 week they significant statistically increased HDL-C level.

**Key Word:** HDL-C level, vitamin B3 (Niacin), CVD-risk factors.

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## INTRODUCTION

Despite numerous therapeutic advances, cardiovascular disease (CVD) remains the leading cause of morbidity and mortality in world wide. Although statins reduce coronary artery disease by approximately 30%,<sup>1,2</sup> substantial

residual cardiovascular risk remains, even with very aggressive reductions in levels of low-density lipoprotein cholesterol (LDLC).<sup>1,3</sup> Accordingly, attention has shifted toward strategies for targeting high-density lipoprotein (HDL) composition as adjunctive therapy to prevent and treat CVD While the quest for the best HDL elevator continues we will have to be content with what we currently have raising plasma levels of high-density lipoprotein (HDL) cholesterol has been a therapeutic goal ever since the strong inverse association between HDL levels and the risk of coronary heart disease was first observed.<sup>4</sup> Studies indicate that low HDL-C levels are relatively common in the general population, with reported rates of HDL -C less than 35 mg / dL of 16% to 18% in men and 3% to 6% in women.<sup>5</sup> In addition, low level of HDL-C is a component of the metabolic syndrome, which has a prevalence of 24% in US individuals older than 20

years.<sup>6,7</sup> Multiple epidemiologic studies have established a low level of HDL-C as an independent risk factor for CVD.<sup>5,8</sup> For example, in the Framingham Heart Study, 43% to 44% of coronary events occurred in persons with HDL-C levels less than 40 mg /dL (22% of the total Study population ).<sup>5</sup> Individuals having HDL-C levels less than 35 mg/dL had an 8-fold higher incidence of CVD compared with those having HDL-C levels of more than 65 mg /dL.<sup>5,8</sup> The strength of the relationship between low HDL-C levels and increased CVD risk also is significant in elderly individuals and may be greater in women than in men.<sup>5,8,9</sup> Angiographic and ultrasonographic data indicate that low levels of HDL-C are associated with risk and severity of coronary artery disease, carotid artery disease, and postangioplasty restenosis.<sup>9,10</sup> In addition, each 1–mg/dL increase is associated with a 6% lower risk of coronary death, independent of LDL-C level.<sup>9, 10</sup> So we have done the study serum HDL with respect to exercise and vitamin B6 supplementation at tertiary health care centre.

## METHODOLOGY

This was a cross-sectional study carried out in the department of Medicine at tertiary health care centre during the one year period i.e. January 2017 to January 2018 in the patients who were having deranged lipid profile with HDL level low were selected for the study by taking written and explained consent all the patients were prescribed exercises like walking at least for 45 min and at least 5 days in a week with oral supplementation of vitamin B3 with RDA (Recommended Daily Allowance) as a B-complex supplementation once in day for 6 weeks. All details of the patients like age, sex, Lipid profile was done at Baseline, 1 month and 6 weeks after the intervention was carried out in subsequent follow up visits. The statistical analysis was done by unpaired t-test and calculated by SPSS 19 version software.

## RESULT

**Table 1:** Distribution of the patients as per the age

Age	No.	Percentage (%)
20-30	12	19.05
30-40	14	22.22
40-50	15	23.81
50-60	13	20.63
>60	9	14.29
<b>Total</b>	<b>63</b>	<b>100.00</b>

The majority of the patients were in the age group of 40-50 were 23.81%, followed by 30-40 were 22.22%, 20-30 were 19.05%, 50-60 were 20.63%, >60 were 14.29%.

**Table 2:** Distribution of the patients as per the sex

Sex	No.	Percentage (%)
Male	39	61.90
Female	24	38.10
<b>Total</b>	<b>63</b>	<b>100.00</b>

The majority of the patients were Male i.e. 61.90% and Female were 38.10%.

**Table 3:** Distribution of the patients as per the mean HDL-C level at baseline and after intervention

HDL-C level	No.	Percentage (%)
Baseline (n=63)	32 ±3.45	
1month after intervention (n=61)	33± 4.12	t=1.4672, df = 122 p>0.05
6 weeks after intervention (n=59)	41.23 ± 3.42	* t=14.8294, df = 120, p< 0.0001

At Baseline (n=63) the mean HDL-C level was (Mean±SD) - 32 ±3.45; 1month after intervention (n=61) - 33± 4.12 there was increase after 1 month but not statistically significant (t=1.4672, df = 122, p>0.05). 6 weeks after intervention (n=59) the mean HDL-C level was - 41.23 ± 3.42 which was significantly higher as compared to baseline level (\* t=14.8294, df = 120, p< 0.0001 )

## DISCUSSION

Experts have known for a long time that exercise helps increase the production and the efficiency of certain enzymes that enhance this "reverse cholesterol transport" process. But how much exercise is necessary to achieve this effect? A study conducted by Japanese researchers has shed some light on the question of how exercise type, frequency, and intensity impact HDL cholesterol. In a meta-analysis, investigators from Tokyo evaluated the effect of exercise on HDL levels. They included data from 35 randomized trials assessing the effect of exercise on HDL levels in While exercise regimens varied among these studies, on average the subjects in these studies exercised for 40 minutes, three to four times per week, and the effect on HDL was measured after eight to 27 weeks. Across the studies, participants had increases in HDL cholesterol averaging about 2.5 mg/dL. This increase in HDL cholesterol was only modest but was statistically significant<sup>11</sup>. Niacin (nicotinic acid or vitamin B3) is the most effective medication to raise HDL cholesterol levels, causing increases of 20 to 35 per cent.<sup>12</sup> The Coronary Drug Project<sup>30</sup> demonstrated a significant reduction in the incidence of death and myocardial infarction after five years of niacin treatment among men with a history of myocardial infarction. Niacin inhibits hepatic uptake of apolipoprotein A-I and increases plasma pre-B HDL cholesterol levels.<sup>13</sup> Niacin therapy is associated with improved endothelial function and nitric oxide synthase activity.<sup>14</sup> In our study we have seen that the majority of

the patients were in the age group of 40-50 were 23.81%, followed by 30-40 were 22.22%, 20-30 were 19.05%, 50-60 were 20.63%, >60 were 14.29%. The majority of the patients were Male i.e. 61.90% and Female were 38.10%. At Baseline (n=63) the mean HDL-C level was (Mean±SD) - 32 ±3.45; 1month after intervention (n=61) - 33± 4.12 there was increase after 1 month but not statistically significant (t=1.4672, df = 122, p>0.05). 6 weeks after intervention (n=59) the mean HDL-C level was - 41.23 ± 3.42 which was significantly higher as compared to baseline level (\* t=14.8294, df = 120, p<0.0001) In some patients with low HDL cholesterol levels various lipid-modifying medications may be useful in combination. The HDL Atherosclerosis Treatment Study (HATS) <sup>15</sup> demonstrated that a combination of low-dose simvastatin (10 to 20 mg per day) and high dose niacin (2 to 4 mg per day) significantly increased HDL cholesterol levels (26 per cent), as compared with placebo, in patients with HDL cholesterol levels of 40 mg per deciliter or less, LDL cholesterol levels of 145 mg per deciliter (3.75 mmol per liter) or less, and triglyceride levels of less than 400 mg per deciliter (4.52 mmol per liter). In the simvastatin niacin treatment group coronary stenoses, as documented on angiography, moderately regressed over three year (0.4 per cent, p < 0.001 vs. placebo; 3.9 per cent increase).

## CONCLUSION

It can be concluded from our study that the B3 supplementation and exercise increased the HDL cholesterol level at one month but not statistically significant; at 6 week they significant statistically increased HDL-C level.

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