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Effects of pranayama technique on lipid profile variables of young adults

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Abstract
The objective of the study was to find out the effect a Pranayama on Lipid Profile variation. The researcher collected the data of fifteen (N=15) young female adults of Department of Physical Education (T),Guru Nanak Dev University, Amritsar (Punjab) between the age group of 21-29 years were selected. The Statistical Package for the Social Sciences (SPSS) version 16.0 was used for all analysis. Student t test for paired samples was utilized to compare the means of the pre-test and the post-test. The level of significance was set at 0.05. It is evident from results that insignificant differences were noted on Lipid Profile Variables between pre-test and post-test in Low Density Lipoprotein Cholesterol (LDL-Cholesterol) and S. Cholesterol/HDLC Ratio of female athletes.

Keywords: pranayama, lipid profile, cholesterol, triglycerides, high density lipoprotein

Introduction
Yoga breathing, or Pranayama, is the science of breath control. It consists of series of exercises especially intended to meet the body's needs and keep it in vibrant health. Pranayama comes from the following words:

- Prana - "life force" or "life energy"
- Yama - "discipline" or "control"
- Ayama - "expansion", "non-restraint", or "extension"

Thus, Pranayama means "breathing techniques" or "breathe control". Ideally, this practice of opening up the inner life force is not merely to take healthy deep breaths. It is intended for yoga practitioners to help and prepare them in their meditation process.
Prana controls all physical tasks for example, the breath, the supply of oxygen, digestion, elimination and much more. The function of the human body is much like a transformer, receiving energy from the Universal flow of Prana, distributing that energy, and then eliminating it. As we develop the ability to control Prana, we gain harmony and health, of both body and mind. In addition to this, with long and consistent practice an expansion of consciousness is experienced.

Methods and Materials
The method of data collection and analysis was quantitatively. The purposive sampling technique was used to attain the objectives of the study. The purpose of this study was to find out the difference of pre-test and post-test on Lipid Profile Variables i.e., S. Cholesterol, S. Triglycerides, High Density Lipoprotein Cholesterol (HDL-Cholesterol), Low Density Lipoprotein Cholesterol (LDL-Cholesterol), VLDL Cholesterol, TG/ HDLC Ratio, S. Cholesterol/HDLC of young female adults of Guru Nanak Dev University.

The young female adults were subjected to a 3-week yogic training programed. The training was consisting of a variety of Pranayama:

- Anuloma Viloma Pranayama (Alternate Nostril)
- Bhastrika Pranayama (Both Nostrils Together)
- Kapal Bhati Pranayama

Selection of subjects
For the purpose of the present study, fifteen (N=15), young female adults of Department of Physical Education (T), Guru Nanak Dev University, Amritsar (Punjab) between the age group of 21-29 years were selected.

Administration of test and collection of data
The data on Lipid Profile variables i.e., S. Cholesterol, S. Triglycerides, High Density Lipoprotein Cholesterol (HDL-Cholesterol), Low Density Lipoprotein Cholesterol (LDL-Cholesterol), VLDL Cholesterol, TG/ HDLC Ratio, S. Cholesterol/HDLC Ratio were assessed in the laboratory of Health Centre, Guru Nanak Dev University, Amritsar. The data was collected on young female adults of Guru Nanak Dev University, Amritsar before (pre-test) and after (post-test) the training period of 3 week.

Statistical technique
Statistical analyses were performed using the Statistical Package for the Social Sciences for Windows version 16.0 software (SPSS Inc., Chicago, IL). Data is expressed as the mean ± SD. Student t test for paired samples was utilized to compare the means of the pre-test and the post-test. The level of significance was set at 0.05.

Analysis of results

Table 1: Descriptive statistics (Mean & Standard Deviation) and paired sample t-test of Lipid Profile variables i.e., S. Cholesterol, S. Triglycerides, High Density Lipoprotein Cholesterol (HDL-Cholesterol), Low Density Lipoprotein Cholesterol (LDL-Cholesterol),VLDL Cholesterol, TG/HDLC RATIO, S. Cholesterol/HDLC RATIO of female athletes of Guru Nanak Dev University.

Group	Number	Mean	Standard Deviation	Standard Error of the Mean	t-value	*p*-value
S. Cholesterol						
Experiment (Pre-test)	15	173.40	11.64	3.01	0.79	0.44
Experimental (Post-test)	15	171.67	18.76	4.84		
S. Triglycerides						
Experiment (Pre-test)	15	135.60	9.46	2.44	0.18	0.85
Experimental (Post-test)	15	134.63	24.88	6.43		
High Density Lipoprotein Cholesterol (HDL-Cholesterol)						
Experiment (Pre-test)	15	46.13	3.56	0.92	1.32	0.20
Experimental (Post-test)	15	48.00	3.91	1.01		
Low Density Lipoprotein Cholesterol (LDL-Cholesterol)						
Experiment (Pre-test)	15	100.10	11.19	2.89	1.76	0.10
Experimental (Post-test)	15	96.72	15.29	3.94		
VLDL Cholesterol						
Experiment (Pre-test)	15	27.16	1.84	0.47	0.22	0.82
Experimental (Post-test)	15	26.94	4.97	1.28		
TG/ HDLC Ratio						
Experiment (Pre-test)	15	2.95	0.22	0.05	0.84	0.41
Experimental (Post-test)	15	2.82	0.59	0.15		
S. Cholesterol/HDLC Ratio						
Experiment (Pre-test)	15	3.77	0.38	0.09	1.51	0.15
Experimental (Post-test)	15	3.59	0.44	0.11		

1 (a). S. Cholesterol

A glance at Table 1 shows the Mean and Standard Deviation values of S. Cholesterol of pre-test and post-test of female athletes was 173.40±11.64 and 171.67±18.76 respectively. The t-value and p-value in case of female athletes was 0.79 and 0.44 as show in the Figure 1.

No significant differences were noted between pre-test and post-test in S. Cholesterol since the calculated value of (t = 0.79) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance. The data does suggest that the difference between pre-test and post-test of female athletes of S. Cholesterol is insignificant. The t-test and p-value for the (Pre-Test & Post-Test) on the variable S. Cholesterol has been presented graphically in Figure 1(a).

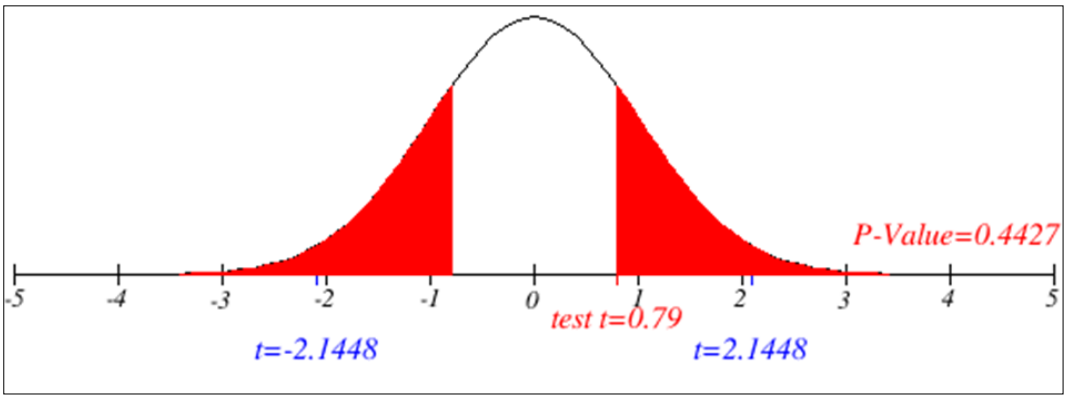


Fig 1(a): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable S. Cholesterol**.**

2. (b). S. Triglycerides

A glance at Table 1 shows the Mean and Standard Deviation values of S. Triglycerides of pre-test and post-test of female athletes was 135.60±9.46 and 134.63±24.88 respectively. The t-value and p-value in case of female athletes was 0.18 and 0.85 as show in the Figure 1.

No significant differences were noted between pre-test and post

-test in S. Triglycerides since the calculated value of (t = 0.18) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance. The data does suggest that the difference between pre-test and post-test of female athletes of S. Triglycerides is insignificant. The t-test and p-value for the (Pre-Test & Post-Test) on the variable S. Triglycerides has been presented graphically in Figure 2(b).

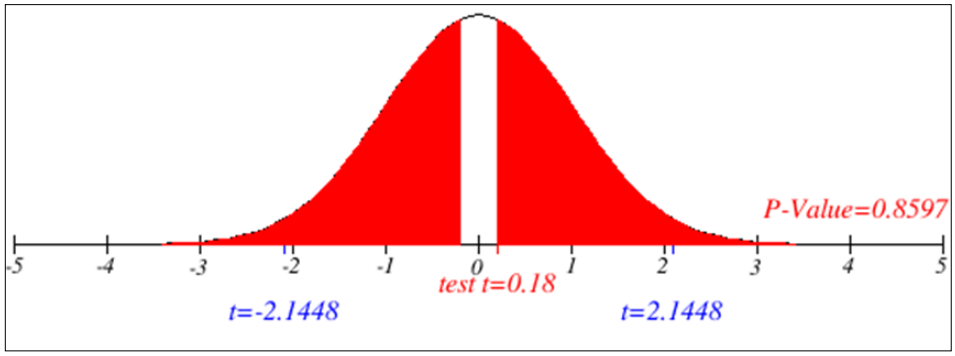


Fig 2(b): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable S. Triglycerides.

3. (c). High Density Lipoprotein Cholesterol (HDL-Cholesterol)

A glance at Table1shows the Mean and Standard Deviation values of High Density Lipoprotein Cholesterol (HDL-Cholesterol) of pre-test and post-test of female athletes was 46.13±3.56 and 48.00±3.91 respectively. The t-value and p-value in case of female athletes was 1.32 and 0.20 as show in the Figure 1.

No significant differences were noted between pre-test and post-test in High Density Lipoprotein Cholesterol (HDL-Cholesterol) since the calculated value of (t = 1.32) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance. The data does suggest that the difference between pre-test and post-test of female athletes of High Density Lipoprotein Cholesterol (HDL-Cholesterol) is insignificant. The t-test and p-value for the (Pre-Test & Post-Test) on the variable High Density Lipoprotein Cholesterol (HDL-Cholesterol) has been presented graphically in Figure 3(c).

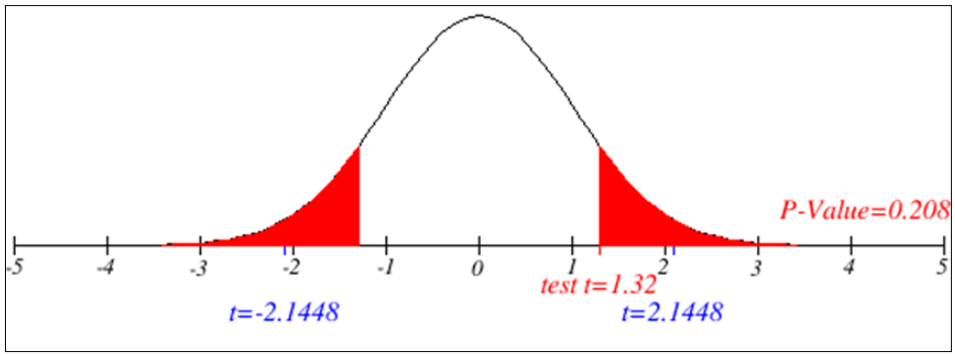


Fig 3(c): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable High Density Lipoprotein Cholesterol (HDL-Cholesterol).

4. (d). Low Density Lipoprotein Cholesterol (LDL-Cholesterol)

A glance at Table1 shows the Mean and Standard Deviation values of Low Density Lipoprotein Cholesterol (LDL-Cholesterol) of pre-test and post-test of female athletes was 100.10±11.19 and 96.72±15.29 respectively. The t-value and p-value in case of female athletes was 1.76 and 0.10 as show in the Figure 1.

No significant differences were noted between pre-test and post-test in Low Density Lipoprotein Cholesterol (LDL-Cholesterol) since the calculated value of (t = 1.76) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance. The data does suggest that the difference between pre-test and post-test of female athletes of Low Density Lipoprotein Cholesterol (LDL-Cholesterol) is insignificant. The t-test and p-value for the (Pre-Test & Post-Test) on the variable Low Density Lipoprotein Cholesterol (LDL-Cholesterol) has been presented graphically in Figure 4(d).

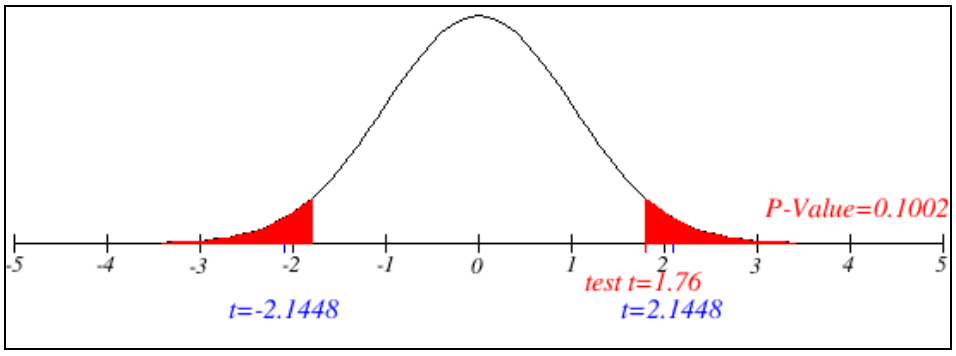


Fig 4(d): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable Low Density Lipoprotein Cholesterol (LDL-Cholesterol).

5. (e). VLDL Cholesterol

A glance at Table 1 shows the Mean and Standard Deviation values of VLDL Cholesterol of pre-test and post-test of female athletes was 27.16±1.84 and 26.94±4.97 respectively. The t-value and p-value in case of female athletes was 0.22 and 0.82 as show in the Figure 1.

No significant differences were noted between pre-test and post-test in VLDL Cholesterol since the calculated value of (t = 0.22) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance. The data does suggest that the difference between pre-test and post-test of female athletes of VLDL Cholesterol is insignificant. The t-test and p-value for the (Pre-Test & Post-Test) on the variable VLDL Cholesterol has been presented graphically in Figure 5(e).

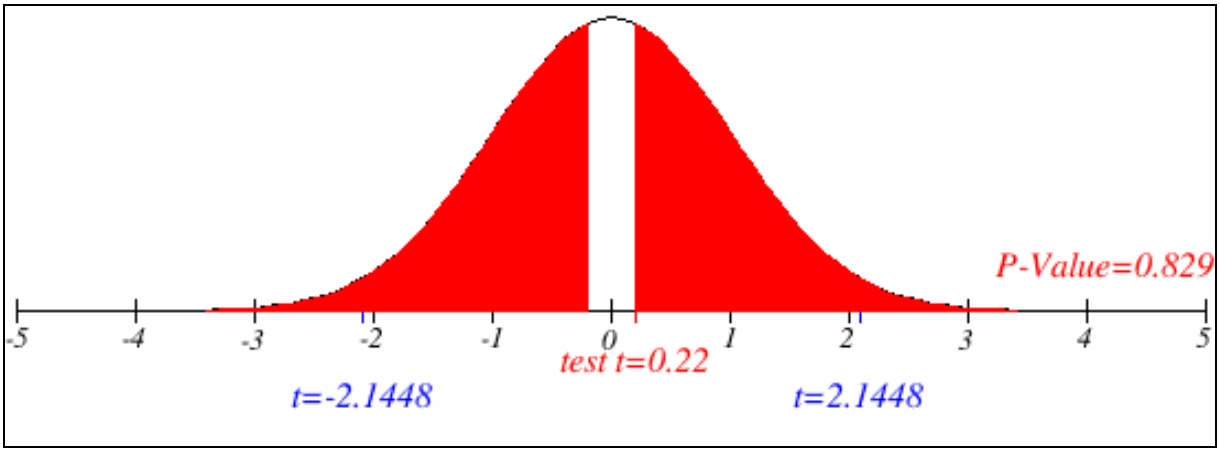


Fig 5(e): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable VLDL Cholesterol.

6. (f). TG/ HDLC Ratio

A glance at Table 1 shows the Mean and Standard Deviation values of TG/ HDLC Ratio of pre-test and post-test of female athletes was 2.95±0.22 and 2.82±0.59 respectively. The t-value and p-value in case of female athletes was 0.84 and 0.41 as show in the Figure 1.

No significant differences were noted between pre-test and post-test in TG/ HDLC Ratio since the calculated value of (t = 0.84) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance. The data does suggest that the difference between pre-test and post-test of female athletes of TG/ HDLC Ratio is insignificant. The t-test and p-value for the (Pre-Test & Post-Test) on the variable TG/ HDLC Ratio has been presented graphically in Figure 6(f).

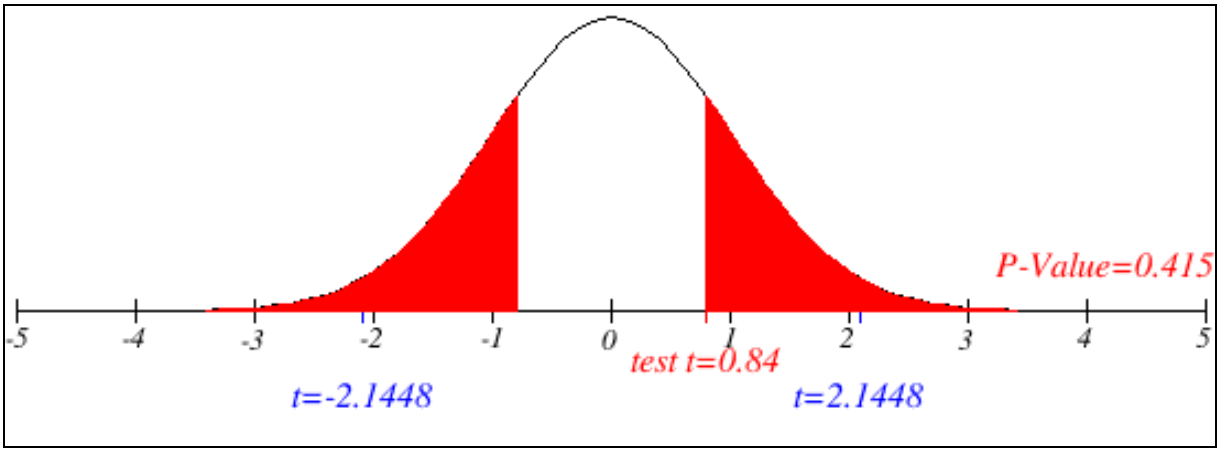


Fig 6(f): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable TG/ HDLC Ratio.

7. (g). S. Cholesterol/HDLC Ratio

A glance at Table 1 shows the Mean and Standard Deviation values of S. Cholesterol/HDLC Ratio of pre-test and post-test of female athletes was 3.77±0.38 and 3.59±0.44 respectively. The t-value and p-value in case of female athletes was 1.51 and 0.15 as show in the Figure 1.

No significant differences were noted between pre-test and post-test in S. Cholesterol/HDLC Ratio since the calculated value of (t = 1.51) is smaller than tabulated value of $t_{0.05}$ (14) = 2.1448 for the selected degree of freedom and level of significance. The data does suggest that the difference between pre-test and post-test of female athletes of S. Cholesterol/HDLC Ratio is insignificant. The t-test and p-value for the (Pre-Test & Post-Test) on the variable S. Cholesterol/HDLC Ratio has been presented graphically in Figure 7(g).

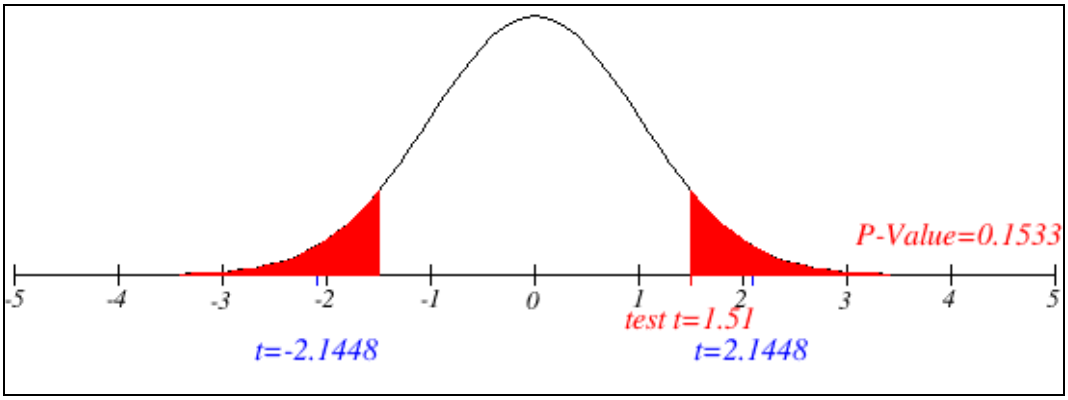
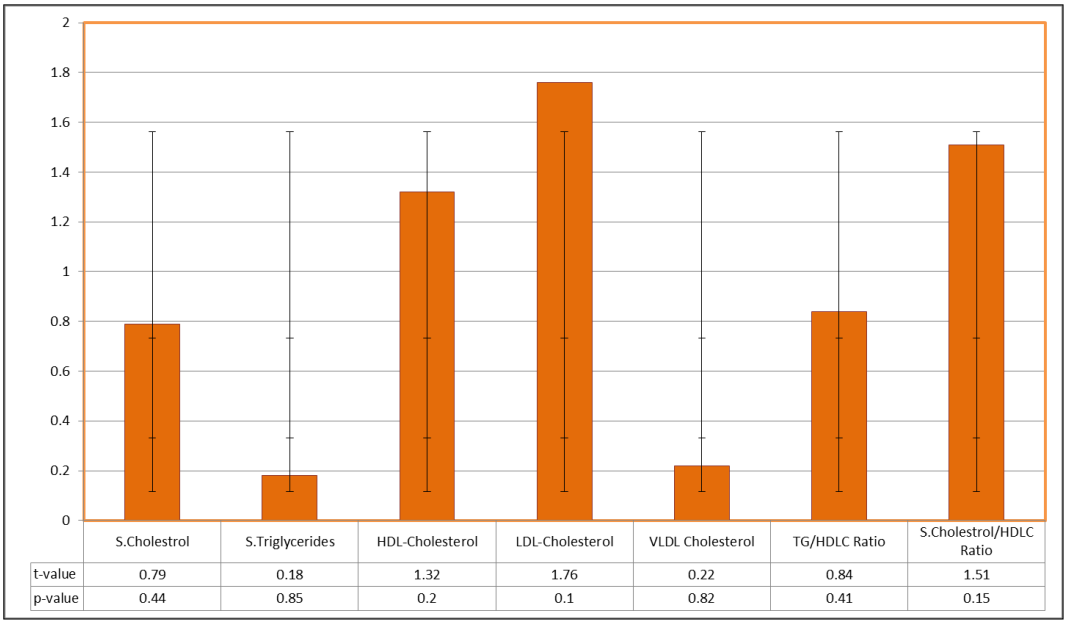


Fig 7(g): t-test and p-value of (Pre-Test & Post-Test) of the female athletes on the variable S. Cholesterol/HDLC Ratio.



	S.Cholestrol	S.Triglycerides	HDL-Cholesterol	LDL-Cholesterol	VLDL Cholesterol	TG/HDLC Ratio	S.Cholestrol/HDLC Ratio
t-value	0.79	0.18	1.32	1.76	0.22	0.84	1.51
p-value	0.44	0.85	0.2	0.1	0.82	0.41	0.15

Fig 1: t-value and p-value of (Pre-Test & Post-Test) of the female athletes on the variable S. Cholesterol, S. Triglycerides, High Density Lipoprotein Cholesterol (HDL-Cholesterol), Low Density Lipoprotein Cholesterol (LDL-Cholesterol), VLDL Cholesterol, TG/HDLC RATIO, S. Cholesterol/HDLC RATIO.

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