EFFECTS OF OATS ON AMONG MALE CHOLESTEROL PATIENTS

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The burden of chronic diseases is rapidly increasing worldwide. Almost half of the total chronic disease deaths are attributable to cardiovascular diseases (CVDs); obesity and diabetes are also showing worrying trends, not only because they already affect a large proportion of the population, but also because they have started to appear earlier in life. A systematic analysis in Global Burden of Disease Study revealed that the US had the highest number of the obese people worldwide (13%) in 2013, while China and India together accounted for 15% of the world's obese population, with 46 million and 30 million obese people, respectively (Marie Ng, Fleming T, Robinson M, Thomson B, Nicholas Graetz N, Margono C, et al., 2013).

It is clear that the earlier labeling of chronic diseases as "diseases of affluence" is increasingly a misnomer, as they emerge both in poorer countries and in the poorer population groups in richer countries. This shift in the pattern of disease is taking place at an accelerating rate; furthermore, it is occurring at a faster rate in developing countries than it did in the industrialized regions of the worldhalf a century ago. This rapid rate of change, together with the increasing burden of disease, is creating a major public health threat which demands immediate and effective action. With lifestyle disorders forcing more and more people to reel under excess body weight, even relatively younger people are developing joint disorders and knee pain. Excessive weight is associated with a series of health problems, including blood pressure, diabetes, and cardiovascular ailments (World Health Organization., 2002).

Experts have pointed that the phenomenon in South Asians has characteristic features- high prevalence of abdominal obesity, with more "intra-abdominal and truncal subcutaneous adiposity."

Weight loss has beneficial effects on blood pressure, lipids and glucose control, and weight loss in the range of 5-10% of initial weight that can confer significant improvement in these variables. In population studies, dietary factors, such as consumption of a vegetarian diet or a diet high in cereal fiber, fruits, and vegetables, also appear to be associated with reduced risk for hypertension, dyslipidemia, and CVD itself. Identification of such factors has stimulated considerable research effort directed toward the prevention of CVD and its risk factors through diet modification. In many circumstances, dietary interventions have been shown to have salutary effects on hypertension and hyperlipidemia. Oats (Avenasativa) is a class of cereal grain essentially grown for human consumption as well as for livestock fodder (Daou C, Zhang H. Oat Beta-Glucan, 2012). Population studies suggest that diets rich in oats or other foods containing soluble fiber are associated with lower levels of blood pressure or rates of coronary disease. Oat or oat fiber consumption has been shown to reduce postprandial glucose and insulin concentrations, and the reduction in insulin concentration may provide a mechanism by which blood pressure could be reduced in response to oats consumption.

Complex diets have shown to impart beneficial results in weight reduction and also in other diseases' management. It remains possible that particular classes of food or individual foods can confer specific benefit. Sometimes, it is difficult to bring about broader dietary changes in the diet; in such cases, it is preferable to introduce individual diet constituents which may bring about a major change. One such possible constituent is oats, a whole-grain cereal that is rich in soluble fiber. The effects of oats on lipid metabolism are well documented, and there is a growing body of literature to suggest that oats also lower blood pressure or help prevent CVD. Population studies suggest that diets rich in oats or other foods containing soluble fiber are associated with lower levels of blood pressure or rates of coronary disease. Oat or oat fiber consumption has been shown to reduce postprandial glucose and insulin concentrations, and the reduction in insulin concentration may provide a mechanism by which blood pressure could be reduced in response to oats consumption (Saltzman E, Das SK, Lichtenstein AH, Dallal GE, Corrales A, Schaefer EJ, et al, 2001).

New insights about the potential benefits of oats have emerged over the past 10 years. More recent data indicate that including oats and oat-based products as part of a lifestyle management program may confer health benefits that extend beyond total cholesterol and low-density lipoprotein (LDL) cholesterol reduction.

Oats remain an important cereal crop in the developing world, and the most popularly cultivated species is Avenasativa L. Compared to other cereals, oats require a cool and moist climate. It requires more moisture for its growth. Oats is predominantly grown in American and European countries, mainly Russia, Canada and the United States of America. Oats are grown in temperate regions. They have a lower summer heat requirement and greater tolerance of rain than other cereals, such as wheat, rye, or barley, so are particularly important in areas with cool, wet summers, such as Northwest Europe and even Iceland. Oats are an annual harvest, and can be planted either in autumn (for late summer harvest) or in the spring (for early autumn harvest) (Francisco E. Contreras-Govea and Kenneth A., 2006).

It was used mostly for animal feeding and to some extent as human food. The use of oats as animal feed has declined steadily owing to emerging use and interest in oats as human health food. Oats consumption in human diet has been increased because of health benefits associated with dietary fibers such as beta-glucan, functional protein, lipid and starch components, and phytochemicals present in the oat grain (Decker EA, Rose DJ, Stewart D., 2012).

In the year 1997, USFDA approved the use of a health claim "3g/day of oat Beta- glucan may help lower blood total and low-density lipoprotein (LDL-C) cholesterol". Over all consumption of oats has increased in the recent years due to its nutritional benefits; presence of Beta-glucan, antioxidants like Avenanthramides, vitamin E (tocotrienols and tocopherols) (Young VL. Oat lipids and lipid-related enzymes, 1986).

The oat (Avena sativa), sometimes called the common oat, is a species of cereal grain grown for its seed, which is known by the same name (usually in the plural, unlike other cereals and pseudo cereals). While oats are suitable for human consumption as oatmeal and rolled oats, one of the most common uses is as livestock feed. Oats are a nutrient-rich food associated with lower blood cholesterol when consumed regularly(Whitehead A, Beck EJ, Tosh S, Wolever TM, 2014).

The oat grain is composed of the oat grout (kernel, caryopsis) and the hull (husk), and it is the dehulled grout that is of interest for human nutrition. The grout contains three compartments which are separated both morphologically and chemically – the bran, the starchy endosperm and the germ. The bran represents the surface layer that envelopes the kernel (Zhang H., 2007). Whereas commercial whole groats rolled oats normally contain approximately 4 % beta-glucans, oat bran typically contains 6-10 % beta-glucans (Wood PJ, Weisz J, Fedec P., 1991). In the oat bran used for the studies in this thesis the beta-glucan content was 6.3-7.5 %. The main composition of Swedish oat grout is 53-73 % starch, 12-23 % protein, 5-14 % lipids and 5-13 % total fiber, of which soluble beta glucans represent 3-6 %60. Compared to other grains, oats contain relatively high levels of proteins, lipids (unsaturated fatty acids), vitamins, antioxidants, phenolic compounds and minerals (Drzikova B, Dongowski G, Gebhardt E, Habel A., 2005).

Review of Literature:

According to WHO (2010), the prevalence of other risk factors of heart failure is also rising in India. In addition to the ageing population, the prevalence of hypertension is projected to increase from 118 million (2000) to 214 million (2025). A 6-fold increase in the incidence of cardiovascular disease is seen in urban India in the last 5 decades and a doubling in prevalence of cardiovascular disease is seen in rural India in the last 3 decades (Reddy et al., 2009).

Pandey et al., (2013), in his nationwide (India) study among urban women has reported a greater prevalence of multiple cardiovascular disease risk factors. This is similar to previous studies on urban-rural differences in cardiovascular risk factors using uniform protocols and has been reported from Haryana, Delhi, Rajasthan and Tamilnadu (Gupta et al., 2008).

Cardiovascular disease comprises major proportions of non-communicable diseases. In 2010, among all the projected worldwide deaths, 23 million deaths are due to cardiovascular diseases. In fact, it is the single largest cause of death in the world accounting for more than one third of all deaths; 7.6 million were attributed to coronary heart disease and 5.7 million to stroke. More than 80 per cent of the deaths occurred in low and middle income countries (WHO, 2011).

According to Chow and Patel (2012), the outcomes in cardiovascular health of women are notably inferior to those in men, especially within the strata of lower socio-economic status and education level. The diversity in Indian population could be a significant factor contributing towards information deficit in prevention and care mechanisms of cardiovascular disease in India.

Meydani (2006) states that oat bran's heart health benefits in maintaining healthy cholesterol levels due in part to a component of oats called beta-glucan which can help to maintain healthy liver function and healthy insulin levels. Finally, antioxidants in oats called avenanthramides helps to keep blood vessels healthy.

Eating oats can spread the rise in blood sugars over a longer time period. Control of blood glucose and insulin levels is essential in preventing many of the complications associated with diabetes. Oat beta-glucan slows the rise in blood glucose levels following a meal and delays its decline to pre-meal levels. Here's how it works. As the beta-

glucan in the soluble fiber of oats is digested, it forms a gel, which causes the viscosity of the contents of the stomach and small intestine to be increased. This in turn slows down digestion and prolongs the absorption of carbohydrates into the bloodstream (Van et al., 2006).

Oats, like other grains and vegetables, contain hundreds of phytochemicals (plant chemicals). Many phytochemicals are thought to reduce a person's risk of getting cancer. Phytoestrogen compounds called lignans in oats have been linked to decreased risk of hormone-related diseases such as breast cancer. Most of the research has been focused on breast cancer, but similar effects are expected on other hormone-related cancers such as prostate, endometrium and ovarian cancer. International research has shown that women with a higher intake of dietary fibrehave lower circulating oestrogen levels, a factor associated with a lower risk of breast cancer. The insoluble fibers in oats are also thought to reduce carcinogens in the gastrointestinal tract (Suzuki et al., 2008).

Maki (2006) shows that daily serving of whole oats rich in soluble fiber can reduce hypertension, or high blood pressure, and so reduce the need for antihypertensive medication. Nearly 1 in 3 American adults has high blood pressure. It usually has no symptoms, but can cause serious problems with the heart and blood vessels, leading to other complications.

Objectives:

1. To know the effect of oats on variouscomponent of cholesterol such asS. Cholesterolof male cholesterol patients.
2. To know the effect of oats on variouscomponent of cholesterol S. Triglyceridesof male cholesterol patients.
3. To know the effect of oats on variouscomponent of cholesterol S.HDL of male cholesterol patients.
4. To know the effect of oats on variouscomponent of cholesterol S.LDL of male cholesterol patients.
5. To know the effect of oats on various component of cholesterol S.VLDL ofmale cholesterol patients.
6. To know the effect of oats on variouscomponent of cholesterol LDL/HDL Ratio of male cholesterol patients.
7. To know the effect of oats on various component of cholesterol total Cholesterol/HDL of male cholesterol patients
8. To know the effect of oats on various component of cholesteroltotal Lipidsof male cholesterol patients.

Hypothesis:

1. There will be no significant effect of oats onS. Cholesterol of male cholesterol patients.
2. There will be no significant effect of oats onS. Triglycerides of male cholesterol patients
3. There will be no significant effect of oats onS.HDL of male cholesterol patients
4. There will be no significant effect of oats onS.LDL of male cholesterol patients.
5. There will be no significant effect of oats onS.VLDLof male cholesterol patients.
6. There will be no significant effect of oats onLDL/HDL ratio of male cholesterol patients.
7. There will be no significant effect of oats on total Cholesterol/HDL of male cholesterol patients.
8. There will be no significant effect of oats ontotal Lipids of male cholesterol patients.

Sample:

The main purpose of present research is to study the effect of Oats on various components of cholesterol such as Serum cholesterol, serum triglycerides, serum HDL, serum LDL, Serum VLDL, Serum LDL/HDL Ratio, total cholesterol /HDL and total lipids among male cholesterol patients. For this purpose 42 male cholesterol patients were taken as participants.

Variables:

In present Research Oats was considering as independent variable andlevel of various components of cholesterol after intervention programwasconsidered as dependent variable.

Tool:

In present research to know the effects of oats among male cholesterol patients Lipid profile test was taken before and after intervention program of each patients.

Procedure:

Lipids profile tests (Pre- test) were examined before introducing oats to the male cholesterol patients. After examining lipids profile test of the patients' researchers has introduce 8 food items of oats like oats mix vegetables & sprouts khichdi, oats rava-palakdhokla, minty vegetables and oats soup, oats palak sprouts mini uttapa, healthy oats chikki, oats khakhra, oats &pohachivda, oats & multigrain biscuits for four months to the male cholesterol patients as an intervention program. The intervention program of consuming oats food items was undertaken for 4

months among male cholesterol patients. After completion of intervention program, lipid profile test (Post-test) was carried out again on same male patients.

Statistical Analysis:

To analyze the data of Pre- test and Post-Test, Mean, SD and t test was used.

Results and Discussion:

Table.1

Mean, SD and t value of various components of Lipid ProfilePre and post (Oats) tests ofmale Cholesterol patients

No	Variable	Group	N	Mean	SD	t value	Level of significantntnt
1.	**S. Cholesterol**	Male Pre	42	235.93	33.61	7.08	0.01
		Male Post	42	186.30	31.38		
2.	**S. Triglycerides**	Male Pre	42	152.47	36.21	2.82	0.01
		Male Post	42	132.93	27.46		
3.	**S.HDL**	Male Pre	42	49.25	4.55	0.71	NS
		Male Post	42	48.57	4.45		
4.	**S.LDL**	Male Pre	42	49.58	4.07	0.99	NS
		Male Post	42	111.15	32.62		
5.	**S.VLDL**	Male Pre	42	7.24	30.49	2.82	0.05
		Male Post	42	5.49	26.59		
6.	**LDL/HDL Ratio**	Male Pre	42	3.23	0.85	4.97	0.01
		Male Post	42	2.34	0.81		
7.	**Total Cholesterol/HDL**	Male Pre	42	4.85	0.92	5.04	0.01
		Male Post	42	3.89	0.85		
8.	**Total Lipids**	Male Pre	42	624.33	87.05	6.81	0.01
		Male Post	42	505.53	74.11		

The above table shows the t value of lipid profile component S. Cholesterol of male Pre and Post test of Cholesterol patients is 7.08. The mean scores of S. Cholesterol of male Pre and Post test of Cholesterol patients were found 235.93 and 186.30 respectively with SD 33.61 and 31.38. The results indicate that pre and post mean scores of S. Cholesterol among male Cholesterol patients differ significantly at 0.01 level. It implies that due to oats S. Cholesterol reduce among male Cholesterol patients.

The t value of lipid profile component S. Triglycerides of male Pre and Post test of Cholesterol patients is 2.82. The mean scores of S. Triglycerides of male Pre and Post test of Cholesterol patients were found 152.47 and 132.93 respectively with SD 36.21 and 27.46. The results indicate that pre and post mean scores of S. Triglycerides among male Cholesterol patients differ significantly at 0.01 level. It implies that due to oats S. Triglycerides reduce among male Cholesterol patients.

The t value of lipid profile component S.HDL of male Pre and Post test of Cholesterol patients is 0.71. The mean scores of S.HDL of male Pre and Post test of Cholesterol patients were found 49.25 and 48.57 respectively with SD 4.55 and 4.45. The results indicate that pre and post mean scores of S.HDL among male Cholesterol patients not differ significantly. It implies that due to oats S.HDL not reduce among male Cholesterol patients.

The t value of lipid profile component S.LDL of male Pre and Post test of Cholesterol patients is 0.99. The mean scores of S.LDL of male Pre and Post test of Cholesterol patients were found 49.58 and 111.15 respectively with SD 4.07 and 32.62. The results indicate that pre and post mean scores of S.LDL among male Cholesterol patients not differ significantly. It implies that due to oats S.LDL not reduce among male Cholesterol patients.

The t value of lipid profile component S.VLDL of male Pre and Post test of Cholesterol patients is 2.82. The mean scores of S.VLDL of male Pre and Post test of Cholesterol patients were found 30.49 and 26.59 respectively with SD 7.24 and 5.49. The results indicate that pre and post mean scores of S.VLDL among male Cholesterol patients differ significantly at 0.05 level. It implies that due to oats S.VLDL reduce among male Cholesterol patients.

The t value of lipid profile component LDL/HDL Ratio of male Pre and Post test of Cholesterol patients is 4.97. The mean scores of LDL/HDL Ratio of male Pre and Post test of Cholesterol patients were found 3.23 and 2.34 respectively with SD 0.85 and 0.81. The results indicate that pre and post mean scores of LDL/HDL Ratio among male Cholesterol patients differ significantly at 0.01 level. It implies that due to oats LDL/HDL Ratio reduce among male Cholesterol patients.

The t value of lipid profile component total Cholesterol/HDL of male Pre and Post test of Cholesterol patients is 5.04. The mean scores of total Cholesterol/HDL of male Pre and Post test of Cholesterol patients were found 4.85 and 3.89 respectively with SD 0.92 and 0.85. The results indicate that pre and post mean scores of total Cholesterol/HDL among male Cholesterol patients differ significantly at 0.01 level. It implies that due to oats total Cholesterol/HDL reduce among male Cholesterol patients.

The t value of lipid profile component total Lipids of male Pre and Post test of Cholesterol patients is 6.81. The mean scores of total Lipids of male Pre and Post test of Cholesterol patients were found 624.33 and 505.53 respectively with SD 87.05 and 74.11. The results indicate that pre and post mean scores of total Lipids among male Cholesterol patients differ significantly at 0.01 level. It implies that due to oats total Lipids reduce among male Cholesterol patients.

Conclusions:

1. Consuming oats in daily food items for four months it shows the post test of male Cholesterol patients have better S. Cholesterolthan pre test male Cholesterol patients.
2. Consuming oats in daily food items for four months it shows the post test of male Cholesterol patients have better S. Triglycerides than pre test male Cholesterol patients.
3. Consuming oats in daily food items for four months it shows that significant difference does not exist between the pre and post test of male Cholesterol patients with regards to S.HDL.
4. Consuming oats in daily food items for four months it shows that significant difference does not exist between the pre and post test of male Cholesterol patients with regards to S.LDL.
5. Consuming oats in daily food items for four months it shows the post test of male Cholesterol patients have better S.VLDL than pre test male Cholesterol patients.
6. Consuming oats in daily food items for four months it shows the post test of male Cholesterol patients have better LDL/HDL Ratio than pre test male Cholesterol patients.
7. Consuming oats in daily food items for four months it shows the post test of male Cholesterol patients have better total Cholesterol/HDL than pre test male Cholesterol patients.
8. Consuming oats in daily food items for four months it shows the post test of male Cholesterol patients have better total Lipids than pre test male Cholesterol patients.

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