Correlation Of Vitamin A And Serum Cholesterol Level In Patients Of Carcinoma Of Esophagus

Ali Raza Memon [1], Hina Riaz [2], Kenjhar Rani [2]

[1]Department of Biochemistry Liaquat Medical University of Medical & Health Sciences (LUMHS) Jamshoro Sindh Pakistan
[2,] Department of Physiology Liaquat Medical University of Medical & Health Sciences (LUMHS) Jamshoro Sindh Pakistan
Corresponding Author: Dr. Ali Raza Memon: aliraza.biolumhs@yahoo.com

Abstract: The present study has shown the correlation of vitamin A and serum cholesterol level in patients of carcinoma of esophagus. Total 30 patients of carcinoma of esophagus and 30 normal which is control group. Vitamin A analyzed as serum retinol by reverse phase HPLC. Serum cholesterol significantly reduced in esophageal cancer patients and decrease level of vitamin A also observed. The above findings suggest that vitamin A will use as therapeutic and preventable element from esophageal cancer because vitamin A also has antioxidant effect.
[Ali Raza Memon, Hina Riaz, Kenjhar Rani. **Correlation Of Vitamin A And Serum Cholesterol Level In Patients Of Carcinoma Of Esophagus.** *Nat Sci* 2014;12(5):139-141]. (ISSN: 1545-0740). http://www.sciencepub.net/nature. 19

Key Words: Vitamin A, Serum Cholesterol, Carcinoma of Esophagus.

Introduction:

Vitamin A act as nutritive factors for maintenance the vision and proper growth and differentiation.[1] Different procedure like cellular proliferation, differentiation, tissue modeling and integrity of tissues mainly under control of metabolites of vitamin A like retinoic acid.[2] Transcription of different genes also regulated by vitamin A metabolites. [3] Vitamin A, E, C and beta carotene are naturally occurring antioxidant. Carotenes have activity due pro vitamin A which act as antioxidant and may have preventive role in pathogenesis of carcinoma. [4] Vitamin A can inhibit oxidative modification because vitamin A is fat soluble vitamin which is transported in LDL particles, due to this it directly related with serum cholesterol level.[4]

Epidemiological and case control studies have indicated that individuals with lower intake of this vitamin are at higher risk of developing certain cancers.[5-7]

Material & Methods:

The present study was done at Liaquat University of Medical & Health Sciences Jamshoro Pakistan, in current study total 50 subjects were enrolled from them 25 subjects were normal having no carcinoma 15 males & 10 females, 25 subjects were diagnosed cases of carcinoma of esophagus 18 males and 7 females were registered for study. The age limit from 25 to 50 years. Blood samples from control and patient subjects was collected after overnight fasting under aseptic measures, serum cholesterol was analyzed by auto chemical analyzer using Bayer's reagent.

Vitamin A (Retinol) was analyzed by reverse phase column High Performance Liquid Chromatography (HPLC) using a 4mm X1cm CLC-OCS-4 guard column. Inert all trans retinyl acetate (Sigma) was used as an internal standard. All chemicals used were of HPLC grade. The results have been expressed as mean ± SE. Student t-test was used for significance correlation coefficients were determined by linear regression analysis.[4]

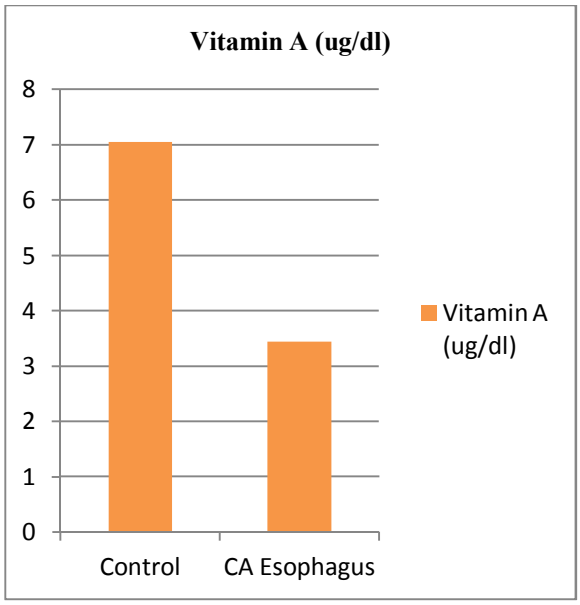
Results:

The mean of vitamin A level in normal healthy control subjects were 7.05 ±0.7ug/dl where mean of vitamin A in the patients of carcinoma of esophagus were 3.44 ± 0.5ug/dl which is shown in table no: 01 and graphically present in graph no: 01. It described that vitamin A level significantly decreased in carcinoma of esophagus (p value <0.05).

Table No: 01

Variable	Control Group (n=30)	CA Esophagus (n=30)
Vitamin A (ug/dl)	7.05 ± 0.7	3.44 ± 0.5

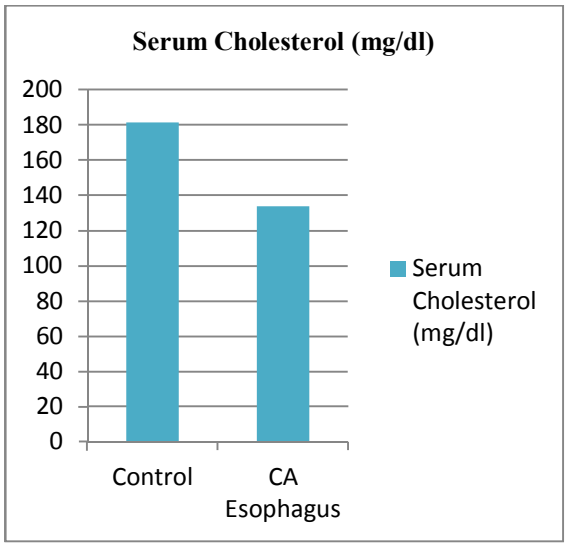
The mean of serum cholesterol level in normal control group were 181.23±6.44 mg/dl where in the patient of esophageal cancer it was 133.72 ± 5.96 mg/dl which is shown in the table no: 02 and presented in graph no: 02. It shows that serum cholesterol level significantly decreased in carcinoma of esophagus (p value <0.01).



Graph No: 01

Table No: 02

Variable	Control Group (n=30)	CA Esophagus (n=30)
Serum Cholesterol (mg/dl)	181.23 ± 6.44	133.72 ± 5.96



Graph No: 02

The correlation of vitamin A and serum cholesterol levels were analyzed by coefficient regression which is ($r > 0.68$). It indicates that vitamin A and serum cholesterol act both together in cancer of esophagus.

Discussion:

Carcinoma of gastrointestinal tract (GIT) is one of the major problem of Pakistan. The cause of carcinoma of esophagus is due to combination of genetic, environmental and dietary factors. Diet plays a vital role in pathogenesis of cancers by altering the lipid metabolism and antioxidant effect.[8] Association of low serum cholesterol with CA esophagus is well known.[2] Vitamin A and other carotenoids are transported in LDL particle.[6, 9] Low cholesterol levels, therefore, could mean low levels of vitamin A as observed in our studies.

It is also established that low cholesterol levels <160mg/dl are associated with risk of cancer, respiratory and liver diseases. Vitamin A deficiency in cancer is well established[8]. Some of the effect is mediated by its role as antioxidant [8, 10]. Retinol, β-carotene and lycopene as well as other carotenoids have antioxidant properties. The antioxidant capability however, is variable depending on the in-vitro system used. The antioxidant activity of these compounds can shift into pro-oxidant effect, depending on oxygen tension or carotenoid concentration. Mixtures of carotenoids alone or in association with other antioxidants can increase their activity against lipid peroxidation [10].In recent years; retinoid have been shown to modify gene expression through the mediation of intracellular binding proteins and nuclear receptors.[3]

Conclusion:

Low levels of vitamin A in patients of CA esophagus result from reduced cholesterol. This in turn leads to cascade of events resulting in pathogenesis of carcinoma of esophagus.

So balanced diet with normal amount of cholesterol and vitamin A can prevent the persons from development of CA esophagus.

References:

1. Underwood, B.A., and Paul, A.The contribution of vitamin A to public health. 1996, 1040-1048.
2. Ben Dor, A., Nahum, A., Danilenko, M., Giat, Y., Stahl, W., Martin, H.D., Emmerich, T., Noy, N., Levy, J., and Sharoni, Y. Effects of acyl retinoic acid and lycopene on activation of retinoic receptor and proliferation of mammary cancer cells. Arch.Biochem.Biophys.2001. 391 (2), 295-302.
3. Budhu, A.S. and Noy, N.Direct channeling of retinoic acid between retinoic acid binding protein 11 and retinoic acid receptor sensitizes mammary carcinoma cells to retinoic acid-induced growth arrest.Mol.Cell.Biol. 22, (8) 2002, 2632-2641.

4. Kritchevsky, S.B. and Kritchevesky, D. Serum cholesterol and cancer risk: An epidemiological perspective Ann. Rev. Nutr.12, 1992, pp: 391 – 416.
5. Salonen, J.T. Salonen, R., Lappetelainer, R. Macnpaa, P.H. and Puska, P. Risk of cancer in relation to serum concentration of selenium and vitamin A and E matched case control analysis of prospective data.Br.Med.J.290, 1985, pp:417-420.
6. Willett, W.C., Polk, B.P., Underwood, B.A., Stampfer, M.J., Pressel, S., Rosner, B., Taylor, J.O., Scneider, K., and Hames, C.G. Relation of serum vitamin A and E and carotenoids to the risk of cancer. N.Engl.Med.J. 310, 1984, pp: 430-434.
7. Handelman, G.J. The evolving role of carotenoids in human biochemistry.Nutrition, 17 (10), 2001, pp: 818-822.
8. Mera, S.L. Diet and disease.Br.J.Med.Sci.51, 1994, pp: 189-206.
9. Zhang, S., Tang, G., Russel, R.M., Mayzel, K.A., Stampfer, M.J., Willett, W.C., Hunter, D.J.. Measurement of retinoids and carotenoids in breast adipose tissue and a comparison of concentrations in breast cancer cases and control subjects. Am J Clin: Nutr, 66, 1997, pp: 626-632.
10. Strain, J.J., Hannigan, B., Mokenna, P.G.The pathophysiology of oxidant damage. J. Biomed. Sci. pp: 2, -24.

5/16/2014