**ISSN: 2349-7750** 



INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.3272118

Available online at: http://www.iajps.com

**Research Article** 

# A CROSS SECTIONAL STUDY TO KNOW THE RELATION **OF SMOKING WITH SERUM HOMOCYSTEINE LEVEL** AMONG HEALTHY INDIVIDUALS

**CODEN [USA]: IAJPBB** 

Dr Muhammad Rehan<sup>1</sup>, Dr Umaira Mushtaq<sup>2</sup>, Dr Suhaib Ahmad<sup>3</sup>

<sup>1</sup> Sharif Medical and Dental College, Lahore

<sup>2</sup> Akhter Saeed Medical and Dental College, Lahore

<sup>3</sup>Liaoning Medical University, China

Article Received: May 2019	Accepted: June 2019	Published: July 2019

## Abstract:

It is known that smoking result in high serum homocysteine levels. Both are linked with high risk of cardiovascular disease.

**Objective:** To know the relationship between smoking habits and serum homocysteine levels in healthy adults. Study design: A cross-sectional study.

Place and Duration: In the Medicine Unit II of Services Hospital, Lahore for Six months duration from September 2018 to February 2019.

Methods: After obtaining informed consent, thirty healthy adults from a nearby Jinnah Hospital, Lahore community were included. Smoking was recorded as a traditional risk factor. Blood samples were collected for the fasting homocysteine levels of the subjects the day after the interview. A standard laboratory protocol was followed for the transport of blood samples and laboratory analysis. The data were included in SPSS 14. To determine the association between smoking and serum homocysteine levels; Chi-square test was used.

Results: The study population consisted of 30 healthy 30 individuals. The majority of people (50%) were between 46-55 years of age. The mean age was 51.1 years. There was masculine domination. 57% of the participants smoked and 43% did not smoke. There was a statistically significant association between smoking and serum *homocysteine levels (p <0.05).* 

**Conclusion:** Smoking seems to be strongly linked with high serum homocysteine levels in healthy individuals. Key words: homocysteine, smoking, healthy adults, cardiovascular disease.

## **Corresponding author:**

Dr. Muhammad Rehan,

Sharif Medical and Dental College, Lahore



Please cite this article in press Muhammad Rehan et al., A Cross Sectional Study To Know The Relation Of Smoking With Serum Homocysteine Level Among Healthy Individuals., Indo Am. J. P. Sci, 2019; 07[07].

The cardiovascular diseases are associated strongly and independently with Smoking and is the largest preventable health habit that contributes to chronic diseases in the Western world<sup>1-4</sup>. In the industrialized world, up to 50% of preventable deaths have been attributed to smoking<sup>5-6</sup>. Smoking is acknowledged to be linked with high serum homocysteine levels<sup>7-8</sup>. Despite the observations, there is little information about the direct and positive relationship between smoking and homocysteine<sup>9</sup>. Therefore, this study was planned to find the relationship between smoking habit and serum homocysteine levels in healthy adults in our population.

#### **MATERIALS AND METHODS:**

It was a cross-sectional study held in the Medicine Unit II of Services Hospital, Lahore for Six months duration from September 2018 to February 2019. Thirty healthy adult residents of different patients who agreed to participate in the study were included



Figure I: Age in years (n = 30

in the study. Smoking history was taken. Blood samples for fasting homocysteine levels were collected on the day after the interview (after a fasting of about 12 hours). All samples were taken on ice, protected from light and centrifuged for one hour for analysis. Laboratory facilities were established from the local laboratory in collaboration with the Abbott diagnosis in Lahore. The classification of homocysteine levels described by Kang SS3 (moderate 15-30 µmol / liter, medium 30-100 µmol / liter, severe> 100 µmol / liter) was followed. SPSS 14 software was used for data analysis. Demographic variables of age, sex and smoking were presented as bar and circular graphs. Chi-square test was used to determine the relationship between smoking and serum homocysteine levels.

### **RESULTS:**

The study population consisted of 30 healthy adults. The majority (50%) were between 46-55 years of age. The mean age was 51.1 years. (Figure I)

## There was male dominance (63%) (Figure II).





57% of the participants smoked and 43% did not smoke. (Figure III)

Figure III: Smoking habit (n = 30)



When the data were analyzed to determine the relationship between smoking habits and serum homocysteine levels, it was found that smoking had a statistically significant relationship with high total homocysteine levels in healthy adults (p < 0.05). (Table I)

level (n = 30)				
Serum total homocysteine level	Smokers	Non- Smokers	Total	
>15 µmol/liter	9	1	10	
≤15 µmol/liter	8	12	20	
Total	17	13	30(p<0.05)	

Table 1: Association of smoking with serum homocysteine level (n = 30)

### **DISCUSSION:**

Smoking has a direct and positive relationship with homocysteine. In this study, serum homocysteine levels were increased in healthy adult smokers<sup>11</sup>. In the 3<sup>rd</sup> nutritional and national health survey, Bazzano and his colleagues analyzed more than seventeen thousand adults and explained that there was a positive and dose-response association between smoking and high homocysteine levels<sup>12</sup>. This increase occurred with the increase of reactive C proteins. These findings showed that the presence of cigarette smoking in the case-control study significantly increased the risk of coronary heart disease associated with hyperhomocysteinemia<sup>13</sup>. In this study, the frequency of hyperhomocysteinemia (> 15 µmol / liter) in the healthy population was lower than that reported by Akhtar N et al (66%) in the healthy population<sup>14</sup>. In this study, the mean age was 51.4 years while the control group was 51.1 years. In our study, there was a male dominance. These results are consistent with international and local data. Several appliances may explain the increased risk of atherosclerosis in smokers with elevated serum homocysteine levels. Smoking affects vasoocclusive factors such as plasma viscosity, fibrinogen levels and platelet aggregation. Hyperhomocysteinemia has been linked with endothelial dysfunction and mild hyperhomocysteinemia and abnormal flow-related vasodilatation have been demonstrated. The fact that both risk factors have similar effects reveals that the interaction between them has great potential for producing vascular damage. Hordaland and other

studies have shown higher levels of homocysteine in smokers<sup>15</sup>.

The limitations of this study should be appreciated. This study had a small sample size. However, this observation needs further evaluation due to the small sample size of this study.

#### **CONCLUSION:**

In our study, we concluded that smoking is significantly associated with high homocysteine levels in healthy asymptomatic adults.

#### **REFERENCES:**

- Awasthi, Manul, Ogbebor Enaholo Omoike, Timir Kumar Paul, Stanley Lee Ridner, and Hadii Mohammed Mamudu. "An association between smoking status and homocysteine levels and whether this association is modified by sex hormones and cholesterol." (2019).
- Zhou, Haitao, Chao Huang, Ruihua Liu, Chao Liu, Congmin Ma, and Xiangyang Ren. "Lack of association between serum homocysteine level and middle cerebral artery stenosis." *Brain and Behavior* (2019): e01297.
- Sung, Sook Hee, Nam Hee Kim, Sun Pyo Hong, Jong-Keun Lee, and Seung Jin Choi. "Associations of Metabolic Syndrome with Total Testosterone and Homocysteine Levels in Male Korean Workers." *Endocrinology and Metabolism* 34, no. 2 (2019): 158-168.
- Bakeberg, M.C., Jefferson, A., Riley, M., Byrnes, M., Ghosh, S., Mastaglia, F.L., Horne, M.K., McGregor, S., Stell, R., Kenna, J. and

Walters, S., 2019. Elevated Serum Homocysteine Levels Have Differential Gender-Specific Associations with Motor and Cognitive States in Parkinson's Disease. *Parkinson's Disease*, 2019.

- Amen, S.O. and Baban, S.T., 2019, June. Association of Hyperhomocysteinemia with Acute Myocardial Infarction in Kurdish Patients. In *IOP Conference Series: Materials Science and Engineering* (Vol. 557, No. 1, p. 012083). IOP Publishing. Amen SO, Baban ST. Association of Hyperhomocysteinemia with Acute Myocardial Infarction in Kurdish Patients. InIOP Conference Series: Materials Science and Engineering 2019 Jun (Vol. 557, No. 1, p. 012083). IOP Publishing.
- 6. Senapati, S., Chaudhary, D. and Sharma, N., 2019. Serum homocysteine could be used as a predictive marker for chronic obstructive pulmonary disease: A Meta-analysis. *Frontiers in public health*, *7*, p.69.
- Foscolou, Alexandra, Loukianos S. Rallidis, George Tsirebolos, Elena Critselis, Andreas Katsimardos, Alexandros Drosatos, Christina Chrysohoou, Dimitrios Tousoulis, Christos Pitsavos, and Demosthenes B. Panagiotakos. "The association between homocysteine levels, Mediterranean diet and cardiovascular disease: a case-control study." *International journal of food sciences and nutrition* 70, no. 5 (2019): 603-611.
- Chen, Tien-Yu, John W. Winkelman, Wei-Chung Mao, Chin-Bin Yeh, San-Yuan Huang, Tung-Wei Kao, Cheryl CH Yang, Terry BJ Kuo, and Wei-Liang Chen. "Short Sleep Duration Is Associated With Increased Serum Homocysteine: Insights From a National Survey." *Journal of Clinical Sleep Medicine*15, no. 01 (2019): 139-148.
- Nam, Ki-Woong, Hyung-Min Kwon, Han-Yeong Jeong, Jin-Ho Park, Hyuktae Kwon, and Su-Min Jeong. "Serum homocysteine level is related to cerebral small vessel disease in a healthy population." *Neurology* 92, no. 4 (2019): e317-e325.
- Nazarinia, Mohammadali, Asghar Zare, and Mesbah Shams. "Association of Serum Homocysteine Level and Interstitial Lung Disease in Systemic Sclerosis: A Case-control Study." *Current rheumatology reviews* 15, no. 1 (2019): 74-78.
- Deng, Chunhua, Zhichao Zhang, Hongjun Li, Peng Bai, Xian Cao, and Adrian Sandra Dobs. "Analysis of cardiovascular risk factors associated with serum testosterone levels

according to the US 2011–2012 National Health and Nutrition Examination Survey." *The Aging Male* 22, no. 2 (2019): 121-128.

- Sun, Yangbo, Minxian Sun, Buyun Liu, Yang Du, Shuang Rong, Guifeng Xu, Linda G. Snetselaar, and Wei Bao. "Association between serum vitamin B12 concentration and obesity in a nationally representative sample of US adults." *Frontiers in Endocrinology* 10 (2019): 414.
- 13. Chen, Yang, Jie Li, Tianyu Li, Jianxiong Long, Jinling Liao, Gong-Hong Wei, Zengnan Mo, and Jiwen Cheng. "Association between homocysteine, vitamin B 12, folic acid and erectile dysfunction: a cross-sectional study in China." *BMJ open* 9, no. 5 (2019): e023003.
- 14. Kang, Dukyun, Seong-Kyu Kang, Won-Jun Choi, Sang Ha Lee, Jun-Hyung Lee, and Kyeongmin Kwak. "Association between shift work and hyperhomocysteinemia in male workers." *Annals of Occupational and Environmental Medicine*31 (2019).
- 15. Minović, I., Sotomayor, C.G., Eggersdorfer, M., Riphagen, I.J., de Borst, M.H., Dekker, L.H., Navis, G., Nolte, I.M., van Zon, S.K., Reijneveld, S.A. and van der Molen, J.C., 2019. Vitamin E Serum Levels and the Challenge to Correct for Lipids: Accounting for the Usual Double Correction for Variance Shared by Total Cholesterol and Fasting Triglycerides Reveals New Insights into the Association with the One-Carbon Pathway. In Vitamin E in Human Health (pp. 201-214). Humana Press, Cham.