



PREVALENCE OF MODIFIABLE RISK FACTORS OF HYPERTENSION IN NIGHT SHIFT WORKERS

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ABSTRACT

Background: Working at night leads to various health problems. Shift workers mostly working in night shifts usually have shorter period of sleep which can lead to various complications depriving the quality of life of these persons. There are many risk factors such as anxiety, obesity, diabetes. Some evidences say that there are acute changes in blood pressure in subjects mostly having shorter period of sleep so there is need to find out the modified risk factors of hypertension in night shift workers. So this study was intended to out the prevalence of risk factors of blood pressure in night shift workers

Objectives: Objectives of the study were to find out and determine the prevalence of modifiable risk factors of hypertension in night shift workers.

Methods: This was an observational study with 100 subjects as a sample. subjects were selected as per inclusion and exclusion criteria. Inclusion criteria included male subjects working for five years or more in night shift in between age group 25-35 years. Subjects having a known history of hypertension, diabetes mellitus and habit of tobacco chewing were excluded from study. Later Questionnaire of hypertension group were distributed and survey was conducted among the subjects. Statistical analysis was done and results were interpreted.

Results: Statistical analysis of Questionnaire of Hypertension Group stated that there is higher risk of hypertension due to modifiable risk factors in subjects working in night shifts.

Conclusion: The study concluded that there are high chances of risk factor of hypertension in night shift workers.

KEYWORDS : Hypertension, night shift workers, modifiable risk for hypertension

INTRODUCTION:

The risk of Cardiovascular diseases are increasing day by day in developing countries. Out of which Hypertension being one of the most common problem.

There are many risk factors for hypertension as well as many researches says that lack of sleep is one of the cause.

Night shift worker mostly tend to have hypertension due to disturbance in sleep. To prevent further complications and to find out the modified risk factor for hypertension in subjects having lack of sleep due to working in shifts so this study was conducted

Working mostly at night is mostly associated with consequences of general health, because of disturbance in chronobiological rhythms, disturbances of the circadian sleep rhythm could disturb the blood pressure and increases the incidence of hypertension. Studies with short duration have found higher risk of blood pressure among shift workers².

Shorter period of sleep can lead to various complications depriving the quality of life of the persons. There are many risk factors such as anxiety, obesity, diabetes. Some evidences say that there are acute changes in blood pressure mostly having shorter period of sleep.

Despite of lack of evidence from short term studies, there is very few evidences that acute changes in blood pressure regulation in shift worker lead to chronic hypertension. People want and able to do everything at any hour of the day and night. Various type of work schedules has been adopted by organizations and companies in which working hours are extended to evenings and night hours, as well as to weekend².

Shift work is associated with an increased risk of coronary heart disease with a direct association between time of

exposure to work in shifts. several studies have also reported a higher prevalence of coronary risk factors among rotating shift workers, due to increased cigarette consumption, higher blood pressure, and increased serum cholesterol, glucose, and uric acid level and urinary adrenaline excretion.

Working in shifts extends the period of production beyond the conventional eight- hour working day. Although the shift workers of fifty years ago were likely to be factory- based workers, increasing demand for services has extended shift work practice to those employed in what are traditionally known as white collar occupations, such as doctors and nurses¹.

Disturbance of worker's normal biological rhythm cause health problems in shift workers³. Most human functions have a rhythm, of approximately a 24-hours period, known as circadian rhythm. These rhythms are determined partly by endogenous factors, the internal body clock, and partly by environmental factors such as daylight, noise, and the social habits of the individual⁵. Multiple physiological, psychological, and behavioral parameter such as body temperature, serum and urinary corticosteroids and electrolytes, cardiovascular functions, gastric enzyme secretion, blood leukocyte count, muscle strength, alertness, mood, and long-term memory follow circadian rhythms⁵. These circadian rhythms, which are related to activities during the day and rest at night, are persistent and rigid and therefore do not adapt immediately to new working patterns⁷.

Researchers Found that persons between 25 and 35 year of age with 5 or fewer hours of sleep per night were twice as likely to have hypertension over an 8 to 10 year follow up period⁸.so this study was conducted to find out the prevalence modifiable risk factors of hypertension in night shift workers.

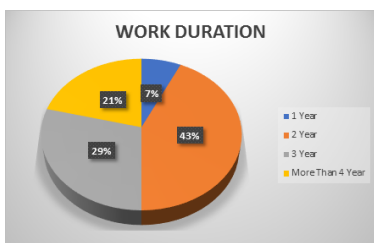
METHODS:

This observational study was carried out in Krishna college of Physiotherapy, KIMS Deemed to be University, Karad after obtaining the Ethical permission from Institutional Ethical Committee. The study included 100 individuals working in night shift. Patients were selected as per the inclusion and exclusion criteria. Inclusion criteria included male subjects working for five years or more in night shift in age group between 25-35 years. Subjects having an known history of hypertension, diabetes mellitus and habit of tobacco chewing were excluded from study. The patients were given all the information about what we are going to do. Later the demographic data such as name, age, gender what time is the shift, height & weight was taken. With the help of consent form, patients consent was taken and study was explained to subjects. With the help of questionnaire of hypertension, patients were assessed and survey was conducted. With the help of statistical analysis results were drawn and interpreted.

RESULTS:

Results was done manually and by using the statistics software INSTAT so as to verify the results derived.

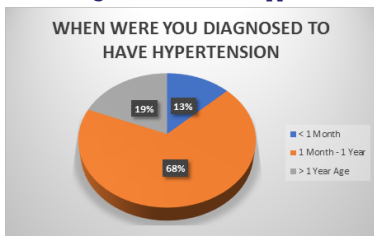
**Question No 1
Work Duration**



Graph 1

This graph represents the working duration of night shifts of the subjects. Out of 100 % 43% subjects worked for 2 years, 29 subjects worked for 3 years, 21 subjects worked for more than 4 years while 7% subjects worked for 1 year.

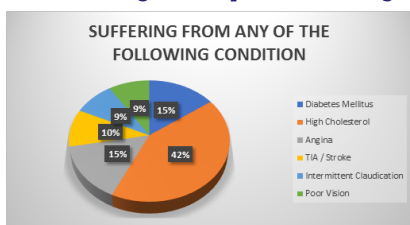
**Question No 2
When Were, You Diagnosed to Have Hypertension**



Graph 2

The graph represents that subject diagnosed with hypertension out of 100%, 68% subject were diagnosed with hypertension in one month to one year, 19% subject were diagnosed with more than one year age, 13% subject were diagnosed with hypertension less than one month

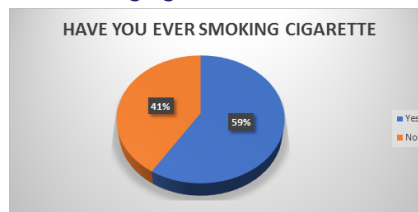
**Question No 3
Have you ever suffering from any of the following condition?**



Graph 3

The graph states that 42% subjects suffer from high cholesterol, 15% subject are suffering from diabetes mellitus, 15% subject are suffering from angina, 10% subject suffering from TIA/stroke, 9% subject are suffering from intermittent claudication, while 9% of subject are suffering from poor vision.

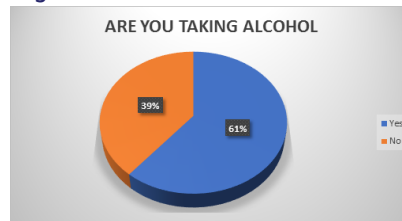
**Question No 4
Have you ever smoking cigarette?**



Graph 4

The graph represents that out of 100% .59% subject were cigarette smoker and 41% subject were not.

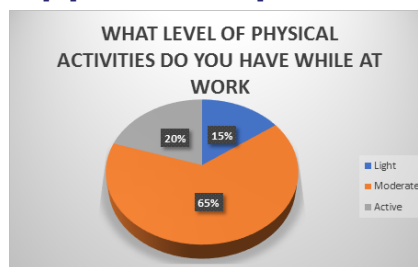
**Question No 5
Are you taking alcohol**



Graph 5

The graph tells us the percentage of subjects addicted to alcohol. 61% subject were alcoholic and 39% subject were not.

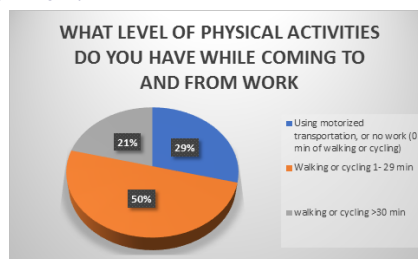
**Question No 6
What level of physical activities do you have while at work**



Graph 6

level of physical activities at work done by the subject out of 100% is represented in graph. 65% subject are doing moderate activities at work, 20% subject are doing active activities at work 15% subject are doing light activities at work.

**Question No 7
What level of physical activities do you have while coming to and from work.**



Graph 7

The graph represents the level of physical activities the subjects do while going to and from work out of 100% subject, 50% subject are walking or cycling in 1mins or 29mins, 29% subject are using motorized transport and 21% subject are walking or cycling more than 30 mins.

Question No 8

What level of activities do you have during your leisure time?

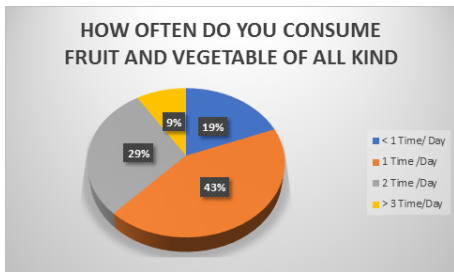


Graph 8

The graph shows us the level of physical activity subjects do during their leisure time. 60% subject are having moderate activities during their leisure time, 21% subject are having high activities during their leisure time, 19% subject are having low activities during their leisure time.

Question No 9

How often do you consume fruit and vegetable of all kind?

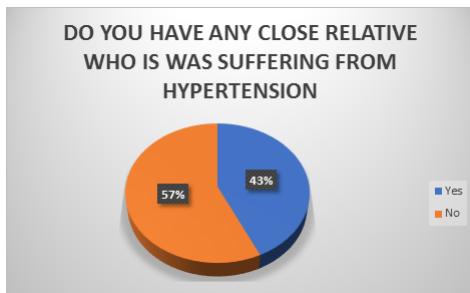


Graph 9

The graph represents the consumption of fruits and vegetables by the subjects. Out of 100%. 43% of subjects consume fruit and vegetables once in a day, 29% consume twice per day, 19% do not consume fruits and vegetables and 9% consume fruits and vegetables more than 3 times a day. This concludes that few no of subjects consume fruits and vegetables in appropriate proportion.

Question No 10

Do you have any close relative who is suffering from hypertension?

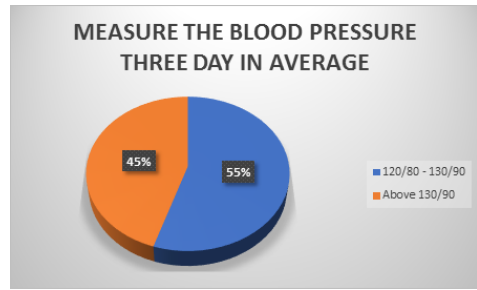


Graph 10

This graph signifies the relation of family history and hypertension. Out of 100 % this graph states that 43 % of subjects are having a family history of hypertension and 57% are not having the family history of hypertension.

Question No 11

Measure the blood pressure three day in average



Graph 11

Out of 100% measure of blood pressure the graph shows 55% of average blood pressure that is between 120/80-130/90 and 45% of blood pressure i.e. blood pressure above 130/90.

DISCUSSION:

This study was done to find out the prevalence of modifiable risk factor of hypertension in night shift workers. The study included 100 subjects between the age group 25 to 35 year having hypertension. A survey was conducted using the questionnaire to find out the modified risk factors for hypertension in night shift workers.

Night shift workers due to lack of sleep are prone to many conditions such as diabetes, anxiety, obesity and hypertension. This study showed that habits such as tobacco chewing, consuming alcohol, reduced physical activity in leisure hours can be the modified risk factors for hypertension in subjects working in night shifts.

This study was done by reviewing other studies with the aim of this study was to find out the prevalence of modified risk factors of hypertension in night shift workers. In previous study conducted by M Shafei, T Tengku, T Winn on The association of shift work and hypertension among male factory workers in Kota Bharu, Kelantan, Malaysia stated that the prevalence of hypertension was significantly higher among shift workers (22.4%) compared to day workers (4.2%)

Previous study conducted by J Yeom et al on Effect of Shift Work on hypertension. This was a cross-sectional study. This study concluded that shift workers had a higher chance of hypertension than day workers. Particularly, the longer the working work continuously, the risk of hypertension getting higher.

So, this study was conducted to find out the risk factors for hypertension in subjects working in night shift. This survey was conducted using questionnaire which consisted to 11 questions such as 1) Work Duration. 2) When Were, You Diagnosed to Have Hypertension 3) Have you ever suffering from any of the following condition. 4) Have you ever smoking cigarette. 5) Are you taking alcohol. 6) What level of physical activities do you have while at work. 7) What level of physical activities do you have while coming to and from work. 8) What level of activities do you have during your leisure time. 9) How often do you consume fruit and vegetable of all kind. 10) Do you have any close relative who is suffering from hypertension. 11) Measure the blood pressure three day in average.

According to questionnaire this study the results of selected subjects stated that Out of 100% 43% subjects worked for 2 years, 29 subjects worked for 3 years, 21 subjects worked for more than 4 years while 7% subjects worked for 1 year. 68% subject were diagnosed with hypertension in one month to one year, 19% subject were diagnosed with more than one year age, 13% subject were diagnosed with hypertension less than

one month .42% subjects suffer from high cholesterol,15% subject are suffering from diabetes mellitus,15% subject are suffering from angina,10% subject suffering from TIA/stroke, 9% subject are suffering from intermittent claudication, while 9% of subject are suffering from poor vision. 59% subject were cigarette smoker and 41% subject were not. 61% subject were alcoholic and 39% subject were not. 65% subject are doing moderate activities at work, 20% subject are doing active activities at work 15% subject are doing light activities at work. 50% subject are walking or cycling in 1mins or 29mins,29% subject is using motorized transport and 21% subject are walking or cycling more than 30 mins. 60% subject are having moderate activities during their leisure time, 21% subject are having high activities during their leisure time, 19% subject are having low activities during their leisure time. 43% of subjects consume fruit and vegetables once in a day, 29% consume twice per day ,19% do not consume fruits and vegetables and 9% consume fruits and vegetables more than 3 times a day. 43 %of subjects are having a family history of hypertension and 57% are not having the family history of hypertension. 55% of average blood pressure that is between 120/80-130/90 and 45% of blood pressure i.e. blood pressure above 130/90.

This results concluded that tobacco chewing, alcohol consumption, reduced physical activity and long working duration in night shifts are the risk factors for hypertension in night shift workers.

This study will help the further researcher to diagnose hypertension as early as possible. It will also help in finding the management strategies in hypertensive subjects to lead a quality life. This study will also help in preventing hypertension by modifying the modifiable risk factors such as tobacco chewing, alcohol consumption which are used by night shift workers to avoid sleep and are the leading cause of hypertension in subjects working in night shifts and having deprived sleep. This study will help in bridging gap in knowledge regarding hypertension by carrying out further researches.

CONCLUSION:

This study concluded that there are high risk of hypertension due to modifiable risk factors in night shift workers

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CONFLICT OF INTEREST: There is no conflict of interest concerning the content of the study.

REFERENCES:

1. S Mohd Nazri, MA Tengku and T Winn the association of shift work and hypertension among male factory workers in Kota Bharu, Kelantan Malaysia. southeast Asian journal of tropical medicine and public health, VOL 39 NO 1 JANUARY 2008.
2. Carla Sfreddo, Sandra Costa Fuchs shift work is not association with high blood pressure of prevalence of hypertension. PLoS ONE 5(12):e 15250.doi: 10.1371/journal. pone. 0015250 Vol 5 issue 12 December 2010
3. Henok Asreshegn Asfaw, Ephrem Mamo Gebrehiwot, Solomon Shiferaw Effect of shift-work on hypertension among factory workers in Ethiopia. American journal of clinical and experimental medicine. Vol 3, no 4 June 2015, 3(4): 142-148.
4. Akerstedt T. shift work and disturbed sleep/wakefulness. Occup med 2003; 53: 89-94
5. Suprgeon A. Working time its impact on safety and health, Geneva: international Lab our organization. 2003: 145pp.
6. Scott AJ, LaDou J health and safety in shift workers in Zenz C, ed. Occupational medicine. Mosby, 1994: 506- 41.
7. Taylor E, Briner RB, Folkard S. models of shiftwork and health: an examination of the influence of stress on shiftwork theory. Human factors.1997: 39: 67- 82
8. James A. McCubbin, June J. Pilcher, D DeWayne Moore blood pressure increases during a simulated night shift in persons at risk for hypertension. International journal of behavioral medicine, 17,314-20, 2010
9. Pati AK, Chandrawanshi A, Reinberg A. shift work consequences and

management. CURRENT SCIENCE, VOL 81, NO 1, JULY 2001.

10. Moore-Ede M, Richardson G medical implication of shift work. Annu Rev Med 1985, 36:607-617.
11. Coffey L, Skipper J, Jung F nurses and shift work effects on job performance and job-related stress. J Adv. Nursing 1988, 13:245-54