HAEMATOLOGICAL PROFILE IN PATIENTS WITH SNORING [WITH OSA AND WITHOUT OSA]

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HAEMATOLOGICAL PROFILE IN PATIENTS WITH SNORING [WITH OSA AND WITHOUT OSA]
ABSTRACT:
TITLE:
Haematological profile in patients with snoring (with OSA and without OSA).
AIM:
To compare and correlate the haematological profile in patients with snoring (with OSA and without OSA).
OBJECTIVES:
1. **To find the history of snoring in 50 patients.**
2. **To classify them into two groups as patients with OSA and without OSA.**
3. **Compare and correlate the haematological profile.**

METHODOLOGY IN BRIEF:
Sample size = 51
Study period-January 2021 to May 2021
Study design: Randomized cross sectional prospective study

To identify 51 patients with snoring clinically. Berlin's score will be used to score these patients. Haematological profile will be compared to Berlin's score.

CONCLUSION:
Based on this study, by analyzing the haematological profile, OSA is associated with derangement of the hematological parameters. It helps in predicting the severity of OSA.

KEYWORDS:
Hematological profile, hemoglobin, platelets, BMI, hypertension, obstructive sleep apnea.

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INTRODUCTION:

Obstructive sleep apnoea (OSA) is a chronic sleep related breathing disorder with an increasing prevalence among middle aged men. [1] OSA is characterised by repetitive episodes of apnoeas or hypopneas during sleep leading to intermittent hypoxemia and arousals.

Long term health conditions including cardiovascular diseases, metabolic disorders, cognitive impairment, and depression are associated with untreated OSA. [2] Excessive sleepiness during day, fatigue, irritability, memory loss, nocturia, morning headache are some of the typical symptoms which in turn lead to loss of productivity and accidents leading to injury and death.[3,4] Number of apnoea's and hypopneas per hour of sleep (apnoea - hypopnea index AHI) is assessed. $5 \geq AHI < 15$ is defined as mild, $15 \geq AHI < 30$ as moderate and $AHI \geq 30$ as severe disease.[5] The outcome of untreated primary snorers and OSA patients in adult male population is dependent on weight increase.[6] the AHI will increase in five units with an increase in BMI by 1 unit during 1 year.[7] Immunological diseases associated with systemic inflammation are also seen in patients with OSA.[8-10]

A number of pathological mechanisms associated include sympathetic nervous system activation, endothelial dysfunction, intermittent hypoxia, hypoxia re-oxygenation, oxidative stress and insulin resistance. [11,12] Elevated inflammatory cytokines, C-reactive protein(CRP), and TNF-a as a result of inflammatory reaction is observed in patients with OSA. [13,14] The aim of this study is to compare and correlate the haematological profile in patients with snoring (with OSA and without OSA).

MATERIALS:

STUDY DESIGN:

1. This was a randomised cross sectional prospective study conducted at the department of Otorhinolaryngology, Saveetha medical college, Chennai.
2. It was done over a period of five months from January to May, 2021. All participants gave their informed consent after explanation of the study objectives.

PATIENTS:

The study comprised of 51 patients with history of snoring admitted at Saveetha Medical College and hospital between January 2021 to May 2021.

METHODOLOGY:

All the patients were subjected to undergo haematological assessment. Data such as name, gender, age, height, weight, BMI, haemoglobin, platelet counts were obtained from all the patients constituting the study population.

BERLIN QUESTIONNAIRE

Berlin questionnaire enquiring about the complaints of snoring, presence of breathing stops during sleep, fatigue during sleep, tiredness, day time sleeping and high blood pressure. The questionnaire consists of 3 categories related to risk of having sleep apnoea and the patients were classified into high risk or low risk based on their responses.

Our inclusion criteria included inpatients aged 18 and above with snoring, obesity, hypertension and open mouth breathing. Exclusion criteria were age < 18 years, diagnosed autoimmune disorders, acute respiration tract infection in recent one month, liver or kidney disease, malignant tumour, chronic alcoholism, hyperthyroidism or hypothyroidism, inflammatory bowel disease, inflammatory connective tissue disorders, heart disease (such as coronary artery disease and heart failure), cerebrovascular accident, history of recent blood transfusion (within 2 weeks), or hematologic disorders such as leukaemia, anaemia, or myelodysplastic syndrome.

RESULTS:

Table 1 shows that among 51 patients enrolled, 49% (n =25) of patients were above 51 years. The mean age of the study group was 50.35 ± 13.771.

The study observed mean BMI of 27.2945 ± 4.45073. The percentage of individuals who were overweight was found to be 41.2% and the percentage of individuals who were obese were 19.6%. Table 2 shows that the prevalence among males (51%) is higher than among females (49%).

Figure 1: Classification of participants based on Berlin Score

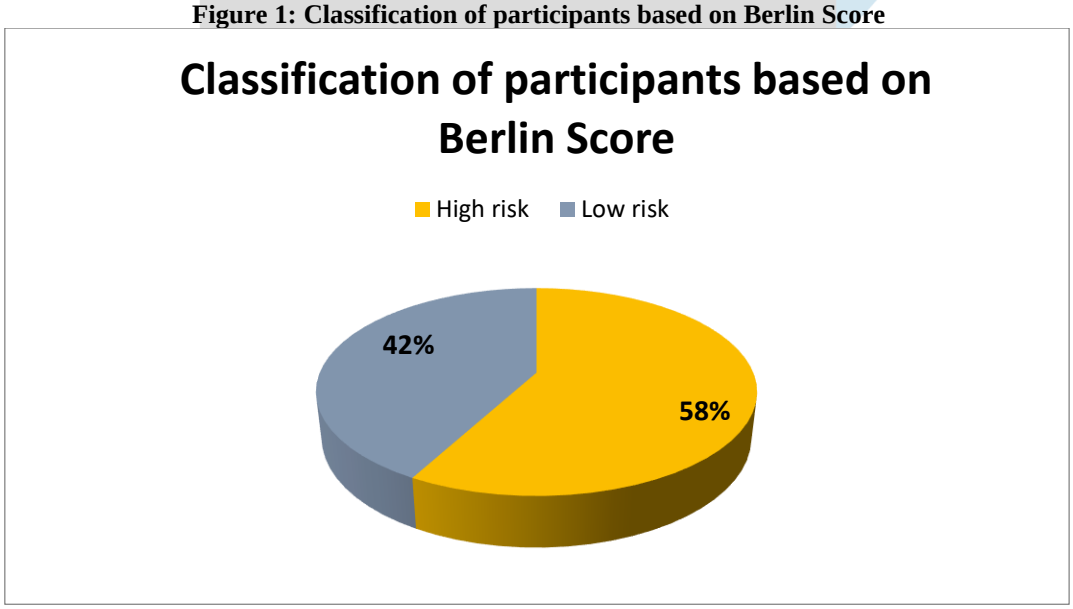

Figure 2: Gender Distribution

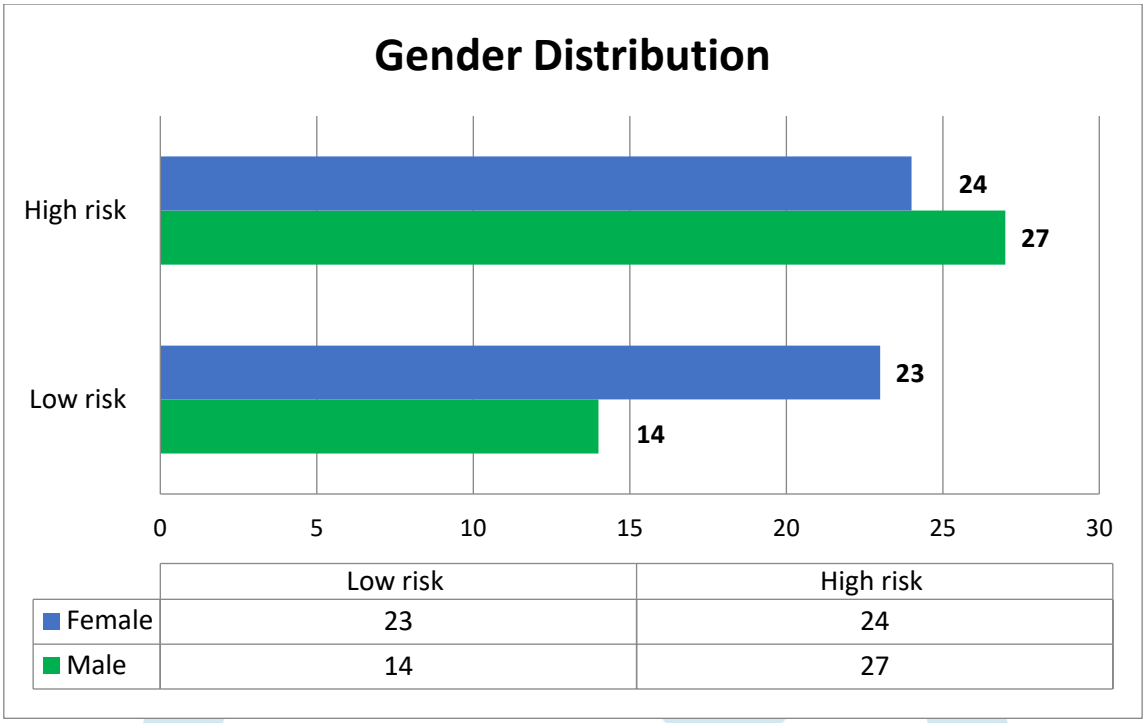

Table 1

S. No	Variables	Low Risk N=37	High Risk N = 51	P Value
		Mean ±SD	Mean ±SD	
1	Weight[1](kgs)	68.7 ± 10.5	77.6 ± 17.6	**0.008***
2	Height[1] (cm)	168.4 ± 8.5	167.5 ± 9.1	0.618
3	BMI[1] (kg/m^2)	24.1 ± 2.6	27.2 ± 4.5	**0.0001***
4	Age [2]			
	< 35 years	25 (67.6)	8 (15.7)	**<0.00001***
	≥35 years	12 (32.4)	43 (84.3)	
5	Gender[2]			
	Male	14 (37.8)	27 (53)	0.160
	Female	23 (62.2)	24 (47)	

***P<0.05 is statistically significant; [1] P value obtained from unpaired t-test; [2] P value obtained from Chi square test.**

S. No	Variables	Low Risk N=37	High Risk N = 51	P Value
		Mean ±SD	Mean ±SD	
1	Hemoglobin (g/L)	10.08 ± 1.51	13.41 ± 1.50	**<0.00001***
2	Platelet (10^9/L)	1.98 ± 0.41	3.57 ± 1.05	**<0.00001***

***P<0.05 is statistically significant; P value obtained from unpaired t-test.**

DISCUSSION:

In the present study, we investigated the association of total blood routine and risk for OSA. OSA is associated with frequent hypoxemia and arousal during sleep. Haemoglobin and platelet counts were statistically significant among patients with OSA. OSA severity may be predicted by haemoglobin and platelet counts. Individuals with increased BMI have a consistent relationship with OSA severity. Moreover, there is an consistent increase in BP among individuals with Apnoeic spells during sleep. Chronic hypoxemia stimulates erythropoietin production, resulting in increased red blood cell volume and Haemoglobin concentration to improve oxygen delivery to tissues. Hypoxia increased RBCV is transiently overcorrected upon rapid return to normoxia by *neocytolysis* that is caused by excessive accumulation of reactive oxygen species.[15]

In previous studies, Patients with OSA have higher MPV and platelet large cell ratio values. They also have relatively increased platelet activation and atherosclerotic risk and other stent thombosis.[16] Interestingly some studies show that CPAP therapy has significantly reduced the effect of platelets. Recent studies by Wasilewski et al reported that in non ST segment elevated myocardial infarction patients with high MPV values, there was 1.5 fold higher mortality rate. [17]

Our results agree with previous studies and shows that haemoglobin and platelet values are independently associated with OSA. There are potential limitations in this study that include small sample size, exclusion of children aged < 18.

CONCLUSION:

In this study, it is noted that OSA is associated with the derangement of haematological parameters. Considering the situation that a large proportion of patients with OSA remain undiagnosed and that OSA can increase risk of mortality from cardiovascular diseases, derangement of haematological parameters should be attention to even within the reference range.

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