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Study of Associated Medical Ailments in Himachal Pradesh Patients Posted For Surgical Procedures At Maharishi Markandeshwar Hospital Solan.

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Abstract
Background: *Himachal Pradesh because of its varied topography is endemic to various medical ailments which are either already present or coincidentally diagnosed in patients presenting for elective or emergency surgical procedures.* ***Aim:*** *The aim of the present study was to determine the incidence and severity of associated medical ailments in Himachal Pradesh population presenting for any surgical intervention and also to evaluate their perioperative course under different anaesthetic techniques.*
Materials and methods: *The present study was prospective and included 1000 adult patients (>19years of age) of either sex, residing in Himachal Pradesh for >10 years and presenting for various surgical interventions.*
Results: *1000 patients were examined out of which 586 were females and 414 were males. 316 patients had associated co-morbidities which included 126 males and 190 females. Diabetes mellitus was the most common disorder overall incidence being 22.4% with 52.6% males and 47.3% females affected. Hypertension was present in 20% patients, 49% males and 51% females affected. Hypothyroidism was seen in 17.6% patients with 25.5% incidence in males and an alarming 74.4% in females. Chronic obstructive pulmonary disease was the associated ailment in 9.2% patients affecting 71.7% males and 28.2% females. Ischemic heart disease affected 7% patients, 42.8% males and 57.1% females. The incidence of other ailments was 1%. Lifestyle changes, smoking, alcoholism, hypercholesterolemia were the common risk factors. The perioperative course of these patients presenting for various surgeries remained uneventful.*
Conclusion: *The non communicable diseases have emerged as a significant menace in Himachal Pradesh, affecting younger age groups and females as well, with diabetes mellitus at number one followed by hypertension, hypothyroidism, chronic obstructive pulmonary disease, ischemic heart disease as inferred from our study. Most of the risk factors identified are modifiable which if curbed early can have a fruitful outcome.*
Keywords: *Diabetes mellitus, Hypertension, Hypothyroidism, Chronic Obstructive Airway Disease, Ischemic Heart Disease, Himachal Pradesh, Surgical patients, Associated medical ailments.*

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I. Introduction

Himachal Pradesh also called DevaBhoomi lying in the laps of Himalayas ranges in altitude from 300 meters to 7000 meters above the sea level. Geographically Himachal is divided into three distinct zones: Shivalik or outer Himalayas, middle or inner Himalayas and greater Himalayas or the alpine zone. Predominantly a mountainous terrain, it is the only state with majority of population residing in villages. Solan with a population of 576,670 is one of the twelve districts of Himachal Pradesh.[1]Sirmaur is the adjoining most south-eastern district of Himachal Pradesh, largely mountainous and rural with 90% population living in villages. Many of the inhabitants of Himachal Pradesh coming for elective or emergency surgical procedures present with associated or co-incidentally diagnosed medical ailments.Higher incidence of associated co-morbidities namely diabetes mellitus[2], iodine deficiency[3], hypertension[4] and chronic obstructive pulmonary disease[5] has been reported in this population. These comorbidities influence their overall perianesthetic management. The present study was a prospective aiming to evaluate the incidence and severity of associated medical ailments in residents of Himachal Pradesh presenting for any surgical intervention and to study the perioperative course of these patients under various anesthetic conditions.

II. Materials And Methods

Afterapprovalfrom the institutional ethical committee, this prospective study was conducted in Maharishi Markandeshwar Medical College and Hospital MMMC&H Solan.1000 adult patients (> 19 years of age) of either sex presenting for various surgical procedures in this hospital formed the study material.Those patients who had recently migrated to this place or were residing for less than 10 years were not included in this study. These patients were evaluated at the time of their reporting to this hospital (in Anaesthesia OPD). A thorough preanaesthetic evaluation was done which included a detailed history, general physical and systemic examination. Height and weight of all these patients was recorded and complete haemogram, urine examination, renal function tests which included blood urea and serum creatinine, serum electrolytes (sodium and potassium), fasting or random blood sugar, 12 lead ECG, X-ray chest (PA) view were ordered. Thyroid function tests were ordered in patients with history of hypothyroidism or hyperthyroidism or symptomatology of thyroid disorders. Echocardiography was advised in cardiac patients with poor metabolic equivalent score. Glycated hemoglobin was done in known diabetics or those with fasting blood sugar>126mg/dl or random blood sugar >200mg/dl. Similarly pulmonary function tests were ordered in known chronic obstructive pulmonary diseases (COPD) or with findings or symptomatology suggestive of COPD. Liver function tests were evaluated in patients with history of jaundice. The patients were then again reviewed at the time of admission by respective surgical units. The investigations were re-evaluatedand premedication prescribed. Thepatients were kept overnight fasting and were undertaken under general anesthesia or regional anesthesia as per the surgical intervention. The patients were monitored throughout the perioperative period and the entire perioperative course was recorded.

III. Results

Total of 1000 patients above 19 years of age coming for emergency or elective surgery were included in the study (Table 1). Out of these 1000 patients, 414 were males and 586 females. These patients were evaluated during their pre-anesthetic checkup for associated medical ailments. 316 patients (126 males and 190 females) had associated co-morbid conditions which were either already present or diagnosed at the time of pre-anesthetic evaluation. Diabetes was the most common associated ailment with incidence of 22.4% followed by hypertension 20%, hypothyroidism 17.6%, COPD 9.2%,Ischemic heart disease 7% and others 1% (Table 2,3). Lifestyle modifications, smoking, alcoholism, hypercholesterolemia and positive family history were the common identifiable risk factors. (Table 4).The perioperative course of all these patients remained uneventful.

Table 1patients Posted For Various Surgeries

Age (In Years)	Surgery	Orthopedics	Gynaecology/ Obstetrics	Number Of Patients
19-29	8	10	80	98
29-39	170	66	84	320
39-49	135	94	30	259
49-59	87	112	17	216
59-69	12	22	8	42
69-79	10	24	4	38
79-89	4	12	6	22
89-99		5		5
TOTAL	426	345	229	1000

Table 2: C0-M0rbidities Seen In Various Age Groups

Age (In Years)	Diabetes	Hypertension	Hypothyroidism	Coad	Ihd	Others
19-29	2		43			3
29-39	18	36	41	5		5
39-49	66	35	47	21	26	2
49-59	61	50	35	49	10	
59-69	29	23	10	12	12	
69-79	37	32		3	10	
79-89	10	20		2	8	
89-99	3	4			4	
Total	224	200	176	92	70	10

Table 3 Sex-Wise Incidence And Prevalence Of Various Co-Morbidities

	TOTAL NUMBER	MALES	FEMALES
Subjects	1000	414	586
Patients with co-morbidities	316	126	190
Dm	224/1000 (22.4%)	118 /224 (52.7%)	106/224 (47.3%)
Ht	200/1000 (20%)	98/200 (49%)	102/200 (51%)
Hypothyroidism	176/1000 (17.6%)	45/176 (25.5%)	131/176 (74.5%)

Copd	92/1000 (9.2%)	66/92 (71.7%)	26/92 (28.3%)
Ihd	70/1000 (7%)	30/70(42.8%)	40/70 (57.2%)
Others	10/1000 (1%)	6/10 (60%)	4/10 (40%)

Dm- diabetes mellitus, ht- hypertension, ihd-ischemic heart disease Copd-chronic obstructive pulmonary disease

Table 4 Risk Factors

RISK FACTORS	PREVALENCE AND INCIDENCE
SMOKING	206/1000 (20.6%) Males 180/1000 (18%) Females 26/1000 (26%)
ALCOHOLISM	325/1000 (32.5%)
HYPERCHOLESTEROLEMIA	26/1000 (2.6%)
IHD PLUS DM	39/70 (55.7%)
IHD PLUS HT	31/70 (44.3%)
IHD PLUS DM PLUS HT	21/70 (30%)
FAMILY HISTORY OF DM	52/1000 (5.2%)
FAMILY HISTORY OF HT	48/1000 (4.8%)
FAMILY HISTORY OF IHD	12/1000 (1.2%)

IHD- ISCHEMIC HEART DISEASE, DM- DIABETES MELLITUS, HT- HYPERTENSION

IV. Discussion

There has been a prodigious increase in the incidence and prevalence of diabetes mellitus worldwide, India being the world capital with 41 million people currently affected and the numbers are expected to rise to 68 million by 2025.[6] Himachal Pradesh has witnessed a surge in diabetes particularly the type II mostly affecting the younger age groups.[2] Most of the diabetics identified are either of normal weight or slightly overweight. Despite Himachal being an agrarian hilly state, the escalation in diabetes is due to lifestyle modification. In our study 224 (22.4%) patients were diabetic out of which 118 (52.6%) were males and 106 (47.3%) were females. These were either already diagnosed diabetic at the time of presentation or co incidentally diagnosed at the time of pre anesthetic evaluation (Fasting blood sugar>126mg/dl or RBS> 200mg/dl).[7]On detailed history taking, faulty lifestyle and unhealthy diet (junk food) were the major culprits. There is now reduced physical activity not only in the urban population but also amongst the tribals probably due to a massive shift from agriculture to commercial fruit crops and preference for office based jobs. More disturbing fact was the trend of shift of diabetes to younger age as well.Another interesting fact which we deduced was the unacceptance on the part of the patients to accept their disease, with more faith towards indigenous medication.Poor knowledge and awareness of the disease process with non-compliance to medication and inadequate followup were other causes of flare up. A high genetic preponderance (5.2%)with either one or both the parents affected was also seen.

Hypertension with incidence of 20% was the second most prevalent disease burden as per our study, the incidence in males and females being 49% and 51% respectively.In adults >60 years age, as per Joint National Committee (JNC) recommendations, hypertension necessitating treatment was labeled at systolic blood pressure (SBP) ≥ 150 mmHg and/or diastolic blood pressure (DBP) ≥90 mmHg while in <60 years the cut offs taken were SBP≥ 140mmHg and/or DBP≥90mmHg.[8]

Accordingly patients on antihypertensives were also included in this group.[9]Hypertension was seen not only among the elderly but affected the younger generation as well. On preanesthetic evaluation 200 hypertensive patients were detected which included those already on treatment or asymptomatic unaware patients detected coincidentally as well as those on erratic treatment. On detailed evaluation faulty lifestyle was the major deterrant. Other risk factors seen were smoking 20.6% with 18% incidence in males 2.6% in females. Besidesa strong genetic influence (4.8%) as in diabetes was also seen with hypertension in our study group. Hypothyroidism with an incidence of 17.6% was another common co-morbid state seen in our patients. An interesting finding was an increased incidence 24.4% in 19-29 age group more than any other co-morbidity. Also an alarmingly higher incidence was seen amongst females 74.4% than males 25.5%, probably because

majority of these patients included gynecological/ obstetric patients (81.6%) presenting primarily for primary infertility or those for caesarean sections with already diagnosed hypothyroidism, on treatment. In others hypothyroidism was detected on the basis of clinical symptomatology like weight gain, cold intolerance, easy fatigability and proved on the basis of thyroid function tests. Normal total T_4, total T_3 and TSH values accepted were 5-12µg/dl, 70-90µg/dl and 0.4-4.2mIU/L respectively. Acceptable free T_4 and free T_3 levels were 0.8-1.8ng/dl and 2.3-4.2pg/ml respectively.Iodine deficiency is aboriginal in Himachal Pradesh. Infact the culmination of Kangra valley experiment (1956-1961) by the Indian scientists led to the implementation of National Goiter Control Program in 1962.[10] Himachal Pradesh has been labeled as a chronic iodine deficient state.[11] Subclinical hypothyroidism (i.e normal T_4 but raised TSH) was a common finding especially amongst the pregnant females detected during the routine screening, on treatment and presenting for routine or emergency caesarean section. Hypothyroidism has been linked with infertility.[12] Our study included patients with primary infertility who were diagnosed with hypothyroidism, inspite of treatment could not conceive and were posted for diagnostic laparoscopy to determine other co-existent causes ofinfertility. The incidence of chronic obstructive airway disease COPD in our study was 9.2% with peak incidence being in 50-60 age group. Majority were males 71.7% and 28.2% females. COPD is an umbrella terminology for a spectrum of progressive lung diseases including emphysema, chronic bronchitis, refractory asthma and some forms of bronchiectasis. Patients with either diagnosed COPD or its symptomatology in the form of breathlessness, chronic productive cough and wheezing were subjected to spirometery to determine the degree of airway compromise. On detailed evaluation smoking both in males and females was the major incriminating factor. Smoking has been associated with structural and inflammatory changes in the alveoli.[13] In females apart from active smoking, exposure to chullah smoke especially in rural areas was another abetting factor.

The incidence of Ischemic heart disease (IHD) was 7%in our study out of which 42.8% were males and 57.4% females. Increased prevalence amongst the younger age groups (Table 2) was seen in our study.55.7% patients of IHD had associated diabetes mellitus, 44.3% had associated hypertension and 30% had both diabetes as well as hypertension associated with IHD. Apart from smoking, hypercholesterolemia with an overall incidence of 21% amongst the study group was the inciting factor. Faulty lifestyle and unhealthy eating were other incriminators. Peak incidence was seen in the 40-49 age groups.There has indeed been a dramatic transition of IHD from the older to younger age groups.[14] Incidence and prevalence of other co-morbidities was 1% (10/1000). These included 5 male patients already diagnosed with G_6PD deficiency, 1 male patient with CrigglerNajar syndrome prior diagnosed and four female patients out of which two had hyperthyroidism and two had rhythm disturbances and were on treatment. The perioperative course of all these patients remained uneventful.

V. Conclusion

Himachal Pradesh has witnessed a recent surge in non-communicable diseases with diabetes mellitus topping the list and hypertension, hypothyroidism, chronic obstructive pulmonary disease and ischemic heart disease being close followers. These disorders pose a significant disease burden on the society affecting younger age groups and females as well as inferred from our study. Lifestyle modifications have been the major contributors towards this trend though the role of smoking, alcoholism, hypercholesterolemia and genetics cannot be ignored. To add to this is the ignorance, avoidance to treatment and poor compliance amongst the people. Need of the hour is to strengthen the health education system with emphasis on the avoidable risk factors so as to curb them early and prevent the escalation of this emerging non communicable disease peril.

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