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## Spectrum of endocrine disorders in a hospitalized patient in a Tertiary University Hospital, Nepal

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### Abstract

**Background:** The epidemiological spectrum of endocrine disorders in hospitalized patients is not much explored in developing countries. Therefore, the spectrum to visualize a complete picture of the endocrine-related disease is still missing. The study aims to find the spectrum of endocrine-related-disorders in a hospitalized patient, characterize demographic variables, and the duration of hospital stay of patients. **Methods:** This was a retrospective study of medical records of admitted cases between January 2014 to December 2018 in the Medicine Ward of BPKIHS. Records were retrieved from the Medical office and were entered into Excel and then transferred to SPSS and were analysed. **Result:** Out of 26,590 admitted cases, 1141 (4.3%) had endocrine-related-disease. This includes 565 males and 576 females (1.02: 1 ratio) with an overall mean age of  $52.81 \pm 16.21$  years and median (IQR) age 53 (42-64) years. Among which 904 (79.2%) had Diabetes mellitus, 118 (10.3%) had Metabolic Disorders, 38 (3.3%) had Disorders of Thyroid gland, 38 (3.3%) had Other Nutritional Deficiencies, 29 (2.5%) had Disorders of other endocrine glands, 7 (0.6%) had other disorders of glucose regulation and pancreatic internal secretion, 5 (0.4%) had Overweight, obesity and other hyperalimentation, 2 (0.2%) had Malnutrition. **Conclusion:** Diabetes and Metabolic disorders are the main components of the spectrum of endocrine disorders in admitted cases. Emphasizing the resources essential for further investigation will help both in dealing with and managing the cases of endocrine disorders.

**Key Words:** Endocrine, Disorders, Hospitalized, Diabetes

### Introduction

The spectrum of endocrine disorders in hospitalized patients is not much explored in developing countries. Due to a lack of data and a smaller number of endocrinologists, the burden of endocrine disorders is not well researched<sup>1</sup>. The number of researches done so far in Nepal has tried to visualize the major burden of Diabetes mellitus and Disorders of thyroid gland in the community<sup>2-4</sup>. However, the lack of spectrum to visualize a complete picture of the endocrine-related disorder is still missing. The need for research to highlight the complete picture of endocrine-related disorders is essential. Though

most of the research-based on hospital setting is based on ease of access to patients and referrals from doctors, the data recorded can characterize the disease, and its frequency, which could reflect the burden of disease in the community. This study has tried to visualize the spectrum of endocrine-related-disease for over five years. This report would further help in emphasizing the need for the management of endocrine disease in a hospital setting in Nepal. The study aims to find the spectrum of endocrine-related-disorders in a hospitalized patient, characterize relevant demographic variables, the duration of hospital admission, and the disease outcomes on a patient's discharge.

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### Methodology

This was a retrospective study of medical records of patients admitted in the Medicine Ward of BPKIHS.

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The hospital, established as an autonomous Health Sciences University in 1993 has been continuously providing service as primary, secondary and tertiary level. This teaching University hospital is main referral center in Eastern Nepal with area of 699 acres of land and over 700 beds<sup>5</sup>. The medicine ward has a capacity of over 90 beds.

After the ethical clearance with Ref. No. 156/078/079-IRC and approval from the department, the medical record was retrieved from the Medical record section for 5 years.

All the cases admitted in Medicine Ward between January 2014 to December 2018 were included. Records that were repeated and incomplete were excluded.

**Data entry and analysis:**

Records were then entered into Microsoft Excel 2007. The data were then transferred to SPSS (Statistical Package for Social Sciences) and analyzed. Data were decoded for categorical and class-interval was made for numerical data in variable view. Diagnosis of patient were entered according to ICD 10 coding International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10)-WHO Version for; 20160.

**RESULT**

26,590 adult cases were admitted in Medicine Ward from January 2014 to December 2018. 1141 (4.3%) had endocrine-related-disease (Figure 1). In Year 2014, 2015, 2016, 2017, 2018, a total of 207, 252, 215, 268, 199 new patients were admitted respectively . This includes a total of 565 (49.5%) males and 576 (50.5%) females with a male-to-female ratio of 1.02: 1. The overall mean age of the patients was 52.81 ± 16.21, with a range of 18-99 years. The median (IQR) age of presentation for males was 53 (42-64) years, which was significantly different from that of female 53 (42-65) years, p< 0.0001. The modal age for both lies 50-69 years with a peak at 60-69 years.

Out of 1141 patient admitted who had endocrine-related-disease, 904 (79.2%) had Diabetes mellitus, 118 (10.3%) had Metabolic Disorders in which 90

(7.9%) had Other Disorders of Fluid, Electrolyte and Acid-Base Balance, 18 (1.6%) Disorders of Mineral Metabolism, 4 (0.4%) had Other and Unspecified Metabolic Disorders, 2 (0.2%) had Volume Depletion, 2 (0.2%) had Disorders of porphyrin and bilirubin metabolism, 1 (0.1%) had Other Disorders of Carbohydrate Metabolism, 1(0.1%) had Disorders of Lipoprotein Metabolism and other Lipidemias , 38 (3.3%) had Disorders of Thyroid gland, 38 (3.3%) had Other Nutritional Deficiencies in which 6 (0.5%) had Deficiency of other B group of vitamins, 2 (0.2%) had Other Vitamin Deficiency , 29 (2.5%) had Disorders of other endocrine glands, 7 (0.6%) had other disorders of glucose regulation and pancreatic internal secretion in which 7 (0.6%) had hypoglycemia unspecified , 5 (0.4%) had Overweight, obesity and other hyperalimantation, 2 (0.2%) had Malnutrition (Table 1).

ICD 10 Classification (E00-89)		Frequency, n (%)
E00-07 Disorders of the thyroid gland	Hypothyroidism Unspecified	38 (3.3%)
	Type 1 DM	67 (5.9%)
E08-13 Diabetes mellitus	Type 2 DM	830 (72.7%)
	Unspecified DM	7 (0.6%)
	Hypoglycaemia Unspecified	7 (0.6%)
E15-E16 Other disorders of glucose regulation and pancreatic internal secretion	Hypoglycaemia Unspecified	7 (0.6%)
E20-E35 Disorders of other endocrine glands	Hypofunction and other disorders of pituitary gland	10 (0.9%)
	Hyperfunction of Pituitary gland	3 (0.3%)
	Cushing's Syndrome	6 (0.5%)
	Hyperaldosteronism	1 (0.1%)
	Other disorders of adrenal gland	8 (0.7%)
	Disease of Thymus	1 (0.1%)
	E40-E46 Malnutrition	Protein-Energy Malnutrition
E50-E64 Other nutritional deficiencies	Deficiency of other nutrients elements	30 (2.6%)
	Deficiency of other B group of vitamins	6 (0.5%)
	Other Vitamin Deficiency	2 (0.2%)

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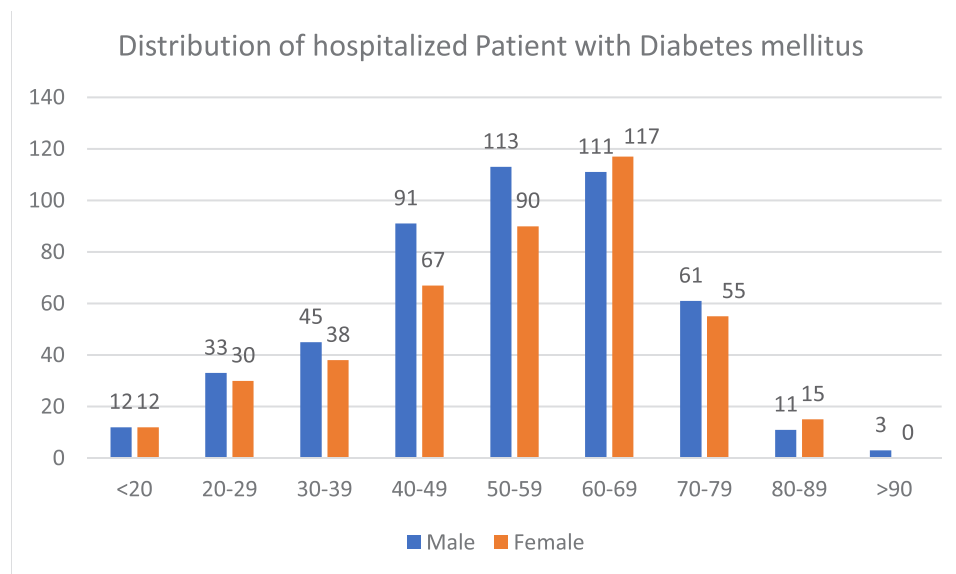


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E65-E68 Overweight, obesity and other hyperalimentation	Obesity Unspecified	5 (0.4%)
E70-E88 Metabolic Disorders	Other Disorders of Fluid, Electrolyte and Acid-Base Balance	90 (7.9%)
	Disorders of Mineral Metabolism	18 (1.6%)
	Other and Unspecified Metabolic Disorders	4 (0.4%)
	Volume Depletion	2 (0.2%)
	Disorders of porphyrin and bilirubin metabolism	2 (0.2%)
	Other Disorders of Carbohydrate Metabolism	1 (0.1%)

**Diabetes Mellitus**

Out of 904 Patients with Diabetes, 480 (53.1%) were male and 424 (46.9%) were female with a male: female ratio of 1.1: 1. Among admitted, with diabetes, 830 (91.8%) were Type 2 DM, 67 (7.4%) were Type 1 DM and 7 (0.8%) Unspecified DM. The median (IQR) age of presentation for males was 54 (43-64) years, which was significantly different from that of females 56 (44.2 -66) years,  $p < 0.0001$ . The modal age for male was 50-59 years while for female was 60-69 as shown in figure 1. The median (IQR) age of patients with Type 2 DM, Type 1 DM, and Unspecified diabetes median were 56 (65-45) years, 25 (35-20) years, 47 (60-29) years respectively, with  $p < 0.0001$ . (Kruskal-Wallis test) and the male: female for Type 2 DM, Type 1 DM, and Unspecified diabetes were 1.1: 1, 1.03:1, and 1.3: 1 respectively.



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Figure 1. Distribution of hospitalized Patient with Diabetes mellitus

**Metabolic Disorders**

Out of 118 (10.3%) patients admitted, who had Metabolic Disorders, 69 (58.5%) were female and 49 (41.5%) were male with female to male ratio 1.4: 1. Among them, 90 (76.3%) had Other Disorders of Fluid, Electrolyte, and Acid-Base Balance, 18 (15.3%) had Disorders of Mineral Metabolism, 4 (3.4%) had Other and Unspecified Metabolic Disorders, 2 (1.7%) had Volume Depletion, 2 (1.7%) had Disorders of Porphyrin and bilirubin metabolism, 1 (0.8%) had Other Disorders of Carbohydrate Metabolism and 1 (0.8%) had Disorders of Lipoprotein Metabolism and other Lipedema. Disorders of Thyroid Glands

Among 38 (3.3%) patients admitted had Hypothyroidism, Unspecified which falls in Disorders of thyroid gland (E00-E07). Out of which 28 (73.7%) were female and 10 (26.3%) were male, with female to male ratio 2.8: 1. The mean age of presentation for males was  $45.3 \pm 21.3$  years and  $46.14 \pm 16.1$  years

for females. The median (IQR) range of presentation for the male was 40 (69.5-28.2) years, which was not significantly different from 43.5 (35.2-61.7),  $p=0.85$ . The modal age for presentation for males is 30-39 years and 40-49 for females.

**Other Nutritional Deficiencies**

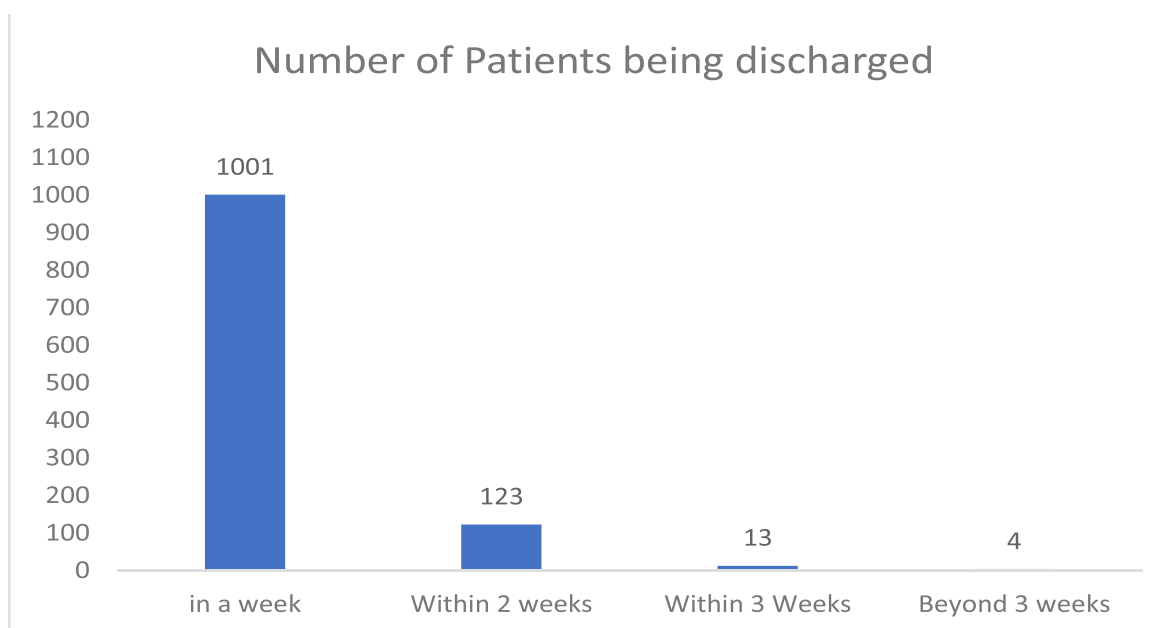
Among admitted, 38 (3.3%) had Other Nutritional Deficiencies, 22 (57.9%) were female and 16 (42.1%) were male giving female: male 1.3: 1. Out of which 30 (78.9%) had Deficiency of other nutrients elements, 6 (15.8%) had Deficiency of other B group vitamins and 2 (5.3%) had Other Vitamin deficiencies.

**Disorders of other endocrine glands**

Among 29 (2.5%) admitted, who had Disorders of other endocrine glands, 23 (79.3%) were female and 6 (20.7%) were male, with a female: male 3.8: 1. Out of which, 10 (34.5%) had Hypofunction and other disorders of the pituitary gland, 8 (27.6%) had Other disorders of adrenal gland, 6 (20.7%) had Cushing's Syndrome, 3 (10.3%) Hyperfunction of pituitary gland, 1 (3.4%) had Hyperaldosteronism, 1 (3.4%) had Disease of Thymus.

**Others**

Among others admitted, 7 (0.6%) were cases who Hypoglycaemia unspecified, 5 (0.4%) had obesity unspecified and 2 (0.2%) were Unspecified Protein-



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### Energy Malnutrition.

The mean duration of patients admitted with these disorders in the hospital was  $4.4 \pm 3.37$  days with 1001 (87.7%) being discharged within a week which consist of 791 (79%) patients with DM, 109 (92.4%) with Metabolic disorders, 36 (94.7%) with Other nutritional deficiencies, 32 (84.2%) with Disorders of Thyroid gland, 20 (69%) with Disorders of Other endocrine glands, 7 (100%) with hypoglycemia unspecified, 4 (80%) with Obesity Unspecified and 2 (100%) with Protein-energy-malnutrition. The number of patients being discharged is shown in figure 2.

### DISCUSSION

In this 5-year study done in Tertiary University Hospital of Nepal, 4.3% patient admitted in the Medicine ward was because of endocrine-related disorders. Diabetes mellitus and metabolic disorder were the major cause of hospital admissions, followed by Disorders of the thyroid gland and Other Nutritional deficiencies.

The number of endocrinologists in Nepal is 47<sup>7</sup>. Endocrinology has been made known to the medical fraternity only a decade ago. Endocrinologists come across 70% of patients with DM, 10-15% of Disorders of thyroid gland, and 15% other endocrine disorders during their practice. The number of endocrine patients treated by surgeons as masses of adrenal gland and pituitary gland and the patient with osteoporosis in the orthopedic clinic, together with masks the actual presentation of endocrine cases<sup>1</sup>.

This study included adult cases of 18 years and above and found that the age group of endocrine disorder was 50-69 years with a peak at 60-69 years. The number of DM patients tugged the age group towards the age group of patients suffering DM.

Diabetes mellitus accounts for 80% admitted cases among endocrine-related-disorders. Type

2 DM records for 72.7% cases, and the period prevalence of Type 2 DM comes out to be 3.1%. As of 2014, the prevalence of Type 2 DM in Nepal is 8.4% [2]. The gap in rate is because of the number of patients managed in out-patient clinics that do not sum up in the record. Also, the cases of Gestation DM come in a record of Obstetric ward and out-patient endocrine-clinic. The age of patients admitted with Type 2 DM has a peak in 50-59 years, while Type 1 DM has a peak in 20-29 years, similar to the findings of the age of diagnosis in most studies<sup>8,9</sup>.

The number of patients admitted with Disorders of thyroid gland 38 (3.3%) is low as compared to the prevalence of Disorders of thyroid gland in Nepal, as most are managed in out-patient-clinics. In addition, there is a female gender preponderance of cases with a ratio of 2.8: 1 similar to findings from other studies<sup>4,10</sup>.

The endocrine cases were assessed and managed by a trained endocrinologist in this study. The lack of accessibility to diagnostic resources like Nuclear imaging, CT, and MRI and the patient economic constraints to pay for such investigation has decreased the number of cases of other endocrine-related-disorder.

The complications in endocrine patients with endocrine disorder were not collected, which is the major limitation of this study. Since this was retrospective study of medical records and the height and weight or (BMI) of patients were not mentioned in most of records, thus the result obtained shows very low rate of Overweight, obesity and other hyperalimentation. Also, the study is based on several admitted cases in the medicine ward. The endocrine-disorder seen in the paediatric and adolescent age group were not recorded.

### CONCLUSION

The endocrine cases account for 4.3% of

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total cases admitted in the Medicine ward. Diabetes and Metabolic disorder are the main component of the spectrum of endocrine-related-disease. Emphasize on prevention, screening and diagnosing these two spectra will help to minimize the major burden of endocrine diseases.

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