

# Study of awareness of adrenal disorders among interns and postgraduate students of Hamidia Hospital, Bhopal

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### ABSTRACT

**Introduction:** Adrenal disorders could be a life-threatening emergency, hence requires immediate therapeutic management. For this awareness regarding its diagnosis, management, and treatment is prime important. **Aims and Objective:** To study the awareness of adrenal disorders among interns and postgraduates students of Hamidia Hospital, Bhopal. **Materials and Methods:** A cross-sectional questionnaire-based study was performed. Fifty-six participants, i.e., 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> years postgraduate residents of general medicine ( $n = 14 \times 3$ ) and interns ( $n = 14$ ) were included in the study. There were 12 questions on adrenal insufficiency, adrenal adenoma, congenital adrenal hyperplasia (CAH), nonclassical CAH (NCCAH), pheochromocytoma, and Conn's syndrome. One mark was awarded for each correct response. **Results:** In the present study, 14 (25%) participants scored < 5 marks, 33 (58.9%) scored between 6 and 9, and 9 (16.1%) scored between 10 and 12. The mean score among the participants was  $6.38 \pm 2.505$ , with a range from 2 to 11 marks. The number of correct answers by postgraduates residents of 1<sup>st</sup> year was 101, 2<sup>nd</sup> year was 95, and 3<sup>rd</sup> year was 93 and interns scored 68 out of total 168 questions in each group. Mean awareness score for residents of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> years participants and interns was  $7.21 \pm 2.806$ ,  $6.79 \pm 2.119$ , and  $6.64 \pm 2.818$  and  $6.63 \pm 2.505$ , respectively. Most of the participants recorded correct responses related to diagnosis (57.7%) followed by responses related to treatment (64.3%). Answers to a question regarding how commonly is adrenal insufficiency diagnosed in medical Intensive Care Unit, none of the individuals responded correctly. **Conclusion:** There was a lack of awareness regarding diagnosis, management, and treatment of adrenal disorders in central India. We need to prioritize training related to these illnesses in our postgraduate teaching curriculum in practice.

**Key words:** Congenital adrenal hyperplasia, Cushing's syndrome, nonclassical congenital adrenal hyperplasia

## INTRODUCTION

Adrenal disorders are multifaceted involving genetics, autoimmunity, infection and environmental endocrine influences as the etiological trigger. It includes various disorders in the form of adrenal insufficiency, Cushing syndrome (CS), secondary hypertension (pheochromocytoma and Conn's

syndrome), and congenital adrenal hyperplasia (CAH) which are treatable and have avoidable morbidity and mortality.<sup>[1-5]</sup> In India, diseases affecting the adrenal glands are an example of environmentally induced endocrine diseases. Hence, infection is the most common cause of adrenal insufficiency in India.<sup>[6]</sup>

Posttubercular adrenalitis leading to insufficiency has been noticed in 46%–56% patients and when further investigated the number rose to 70%–75%.<sup>[7]</sup> Increase in the

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incidence of HIV/AIDS has also contributed in increasing the number of cases presenting as adrenal insufficiency. Adrenal insufficiency is one of the most common causes of cardiovascular instability leading to shock and death in India. Cortisol deficiency leading to hypotension, shock, and nonrecovery of patient is commonly encountered. The diagnosis and management of primary adrenal insufficiency needs a high degree of suspicion, acumen, knowledge about adrenal disorders, and a protocol-based approach.<sup>[8-10]</sup> CAH, an autosomal recessive disorder of defective steroidogenesis, is as common as 1/10,000–1/20,000 for salt wasting/simple virilizing. CAH and for the milder varieties such as nonclassical CAH (NCCAH), the incidence is 1/1000 cases. Infertility, delayed puberty, and metabolic syndrome are the critical challenges which are associated with CAH.<sup>[11,12]</sup>

India is at the epoch of socioeconomic transition and diseases such as obesity and polycystic ovarian disease are nowadays very common among young females. NCCAH comes in the close differentials of these illnesses. The burden of such adrenal disorders is very high in clinical practice, but the level of awareness is not that high among medical graduates and postgraduate students.<sup>[11,12]</sup>

Very few studies have been conducted to test the awareness of adrenal disorders among interns and postgraduate students (General Medicine). Hence, the present study was conducted with the objective to assess the knowledge and preparedness of the interns and postgraduate students to tackle the adrenal disease.

## MATERIALS AND METHODS

The present cross-sectional questionnaire-based study was performed on 56 participants of 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> year postgraduate residents of general medicine ( $n = 14 \times 3$ ) and interns ( $n = 14$ ) in the Department of Medicine, Gandhi Medical College, Bhopal, Madhya Pradesh, among the postgraduate students and interns posted in the department of medicine. Written informed consent was taken from every participant. Confidentiality of the participants and the data collected were maintained at every step and the data collected were used for study purpose only.

After explaining the objective of the study, the questionnaire comprising different multiple choice questions were distributed. The questionnaire covered a range of questions (12 questions in total) that would test basic knowledge about the participants on topics such as adrenal insufficiency, adrenal adenoma, CAH, NCCAH, pheochromocytoma, and Conn's syndrome. No remuneration was given to the participants. No data

on age and gender were collected to further protect the individual identity of the participants. Each question was allotted one mark. The questionnaire was given to every participant, who answered the questions anonymously and the answers were kept confidential. The survey was opened from 21<sup>st</sup> to 23<sup>rd</sup> June 2015.

The data were analyzed descriptively (frequency analysis) by disease type (primary adrenal insufficiency, CAH, NCCAH, CS, pheochromocytoma, and Conn's syndrome), treatment, and dosing regimen.

## RESULTS

Among the study participants, 14 (25%) participants scored <5 marks, 33 (58.9%) scored between 6 and 9, and 9 (16.1%) scored between 10 and 12 [Table 1]. The mean score among the participants was  $6.38 \pm 2.505$  with a range from 2 to 11 marks [Table 2].

The number of correct answers by postgraduate residents of 1<sup>st</sup> year was 101, 2<sup>nd</sup> year was 95, and 3<sup>rd</sup> year was 93 and interns scored 68 out of total 168 questions in each group [Table 2]. Mean awareness score for residents of 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> year participants and interns was  $7.21 \pm 2.806$ ,  $6.79 \pm 2.119$ , and  $6.64 \pm 2.818$  and  $6.63 \pm 2.505$ , respectively [Table 3].

The residents who answered correctly for adrenal disease-related disorders were 45.5%, (maximum by 1<sup>st</sup> year: 52.45% and minimum by interns: 36.9%), related to diagnosis were 57.7% (maximum by 2<sup>nd</sup> year: 69% and minimum by interns: 42.9%), and related to treatment were 64.3% (maximum by 1<sup>st</sup> and 3<sup>rd</sup> year: 71.4% and minimum by interns 50%) [Table 4].

Answers to a question regarding how commonly is adrenal insufficiency diagnosed in medical Intensive Care Unit, none of the individuals responded correctly. Awareness score regarding adrenal insufficiency was 47.6% (maximum by 2<sup>nd</sup> year: 58.3% and minimum by interns: 28.6%), treatment for adrenal insufficiency was 40.5% (maximum by 2<sup>nd</sup> year and minimum by interns: 33.3%), CAH was 63.4% (maximum by 1<sup>st</sup> year: 78.5%), pheochromocytoma was 50.9% (maximum by 1<sup>st</sup> year: 57.1%), Conn's disease was 58.9% (maximum by 3<sup>rd</sup> year: 78.6%), and overall correct response was maximum for CAH (63.4%) and minimum for adrenal insufficiency (47.6%).

## DISCUSSION

Endocrine disorders in several million children and adults in India remain undetected and untreated because of

inadequate professional expertise and a lack of reliable diagnostic services. Therapeutic benefits are not available to millions suffering from endocrine diseases in this country. General practitioners and some specialists often fail to suspect endocrine disorders, even in likely cases. Studies have shown that in India, one in every four patients with tuberculosis has adrenal involvement, yet few are investigated for this. Adrenal insufficiency due to tuberculosis may account for thousands of deaths annually.<sup>[7]</sup>

Endocrine training in India consists of a brief nonformal exposure during postgraduate training in the form of patients admitted in wards being treated for additional endocrine illnesses, the curriculum of examinations usually does not have cases of diabetes, thyroid, and other endocrine illnesses. Neurology, cardiology, pulmonology,

and gastroenterology form the major chunk of postgraduate curriculum in general medicine, where endocrine training is the less sort after.<sup>[7,13]</sup> The burden is huge, training opportunities in postgraduate curriculum is given less importance. Hence, the responsibility of endocrine training in India is at the superspecialty courses such as DM in endocrinology, DNB training in endocrinology, and post doctoral certificate courses. There are somewhere around seventy endocrine superspecialty postgraduates who are completing the training every year, i.e., we are having one newly trained endocrinologist every year to cater a population of roughly 2 million.<sup>[9]</sup>

The mean score obtained among the study participants was  $6.38 \pm 2.505$ , score ranged from 2 to 11 marks. This is a clear reflection of the lack of priority, acumen, and awareness of adrenal disorders in our medical teaching curriculum which is actually followed. When we saw the breakup of correct responses, it was maximum by the 1<sup>st</sup> year resident, followed by 2<sup>nd</sup> year and 3<sup>rd</sup> year. Interns gave the least number of correct response. This can be explained by the preparation during the postgraduate entrance examinations, which has improved the knowledge among the 1<sup>st</sup> year residents as compared to interns and later during the 2<sup>nd</sup> and 3<sup>rd</sup> year of residency, the knowledge has declined because of less discussion in clinical rounds, case presentation, and awareness of adrenal disorders during training. The trend of awareness, diagnosis, and management of adrenal disorders followed the same pattern as the responses given above.<sup>[2]</sup> Similar issues are addressed in an editorial by Bajaj *et al.*<sup>[14]</sup>

Commonality of adrenal disorders was not acknowledged by all the participants in our study. Awareness score regarding adrenal insufficiency was 47.6% (maximum by 2<sup>nd</sup> year: 58.3% and minimum by interns: 28.6%), treatment for adrenal insufficiency was 40.5% (maximum by 2<sup>nd</sup> year and minimum by interns: 33.3%), CAH was 63.4% (maximum by 1<sup>st</sup> year: 78.5%), pheochromocytoma was 50.9% (maximum by 1<sup>st</sup> year: 57.1%), Conn's disease was 58.9% (maximum by 3<sup>rd</sup> year: 78.6%), and overall correct response was maximum for CAH (63.4%) and

**Table 1: Total score distribution among responders**

Score	1 <sup>st</sup> year resident	2 <sup>nd</sup> year resident	3 <sup>rd</sup> year resident	Interns	Total
0-5	3 (21.4)	1 (7.1)	3 (21.4)	7 (50)	14 (25)
5-9	7 (50)	11 (78.6)	8 (57.1)	7 (50)	33 (58.9)
10-12	4 (28.6)	2 (14.3)	3 (21.4)	0	9 (16.1)

Data is expressed as number of responders (%)

**Table 2: Response to the question in numbers (12 question x 14 participants in each group=168 responses)**

Response	1 <sup>st</sup> year resident	2 <sup>nd</sup> year resident	3 <sup>rd</sup> year resident	Interns	Total
Right	101	95	93	68	357
Wrong	67	73	75	100	315

**Table 3: Mean scores of the participants included in the study**

Doctors groups	Mean±SD	Minimum score	Maximum score
Resident 1 <sup>st</sup> year	7.21±2.806	2	11
Resident 2 <sup>nd</sup> year	6.79±2.119	3	10
Resident 3 <sup>rd</sup> year	6.64±2.818	2	11
Interns	4.86±1.657	3	9
All doctors	6.38±2.505	2	11

SD: Standard deviation

**Table 4: Percentage awareness among different doctor groups**

Awareness regarding questions for	1 <sup>st</sup> year resident	2 <sup>nd</sup> year resident	3 <sup>rd</sup> year resident	Interns	All doctors
Adrenal disease	52.4	45.2	47.6	36.9	45.5
Diagnosis of adrenal disease	64.3	69.0	54.8	42.9	57.7
Treatment of adrenal disease	71.4	64.3	71.4	50.0	64.3
Adrenal insufficiency	51.2	58.3	46.4	34.5	47.6
Congenital adrenal hyperplasia	78.6	53.6	57.1	64.3	63.4
Pheochromocytoma	57.1	42.9	50.0	53.6	50.9
Conn's disease	71.4	64.3	78.6	21.4	58.9
Diagnosis of adrenal insufficiency	50.0	71.4	50.0	28.6	50.0

minimum for adrenal insufficiency (47.6%). Similar issue was addressed by Bajaj *et al.*<sup>[14]</sup> There is a huge responsibility on the medical teaching fraternity for the diagnosis, management, and treatment of adrenal disorders in central India. Seeing to commonality of adrenal-related illnesses and a large number of cases, there should be awareness among the postgraduate students in medicine regarding adrenal-related illnesses. There are fewer opportunities in terms of number for endocrine-related post-MD training in India. We need to make our postgraduates in medicine well versed with the knowledge of adrenal disorders.

## CONCLUSION

Adrenal disorders are common in India. There is a lack of awareness regarding diagnosis, management, and treatment of adrenal disorders in central India. We need to prioritize training related to these illnesses in our postgraduate teaching curriculum in practice.

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### Conflicts of interest

There are no conflicts of interest.

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