

# Comparative Study to Evaluate the Knowledge Level about Acromegaly and Gigantism among Medicine UG Students Posted at Diabetic Unit in Tertiary Care Teaching Hospital Belagavi

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## ABSTRACT

Acromegaly and gigantism are rare clinical entities caused by hyper secretion of growth hormone (GH) produced by solid monoclonal somatotrophic pituitary adenoma that occurs sporadically. The aim of the study is to evaluate the knowledge level about acromegaly and gigantism among medicine UG students posted at diabetic unit. In this presents study the researcher employed descriptive and quantitative approach. The number of subjects was 25, and purposive sampling technique was used for data collection and analysis.

**Aim:** To evaluate the knowledge level about acromegaly and gigantism among medicine UG students posted at diabetic unit and to determine association between knowledge level and selected demographic variables.

**Materials & Methods:** The methodology employed in the present study is descriptive in nature, for evaluating the level of knowledge structured questionnaires are used, number of subjects were 25, and sampling technique of the present study is purposive sampling, and for data analysis descriptive and inferential statistics used.

**Results:** Revealed that knowledge level in accordance to qualification with mean, mean percentage and standard deviation. Medicine UG 1st year, revealed that majority of the respondents perceived poor score that is about 1 (60%), and SD is 6.1. more or less similar respondents perceived average score that is about 1.5 (40%), and SD will be 3.5. Medicine UG 2nd year, revealed that majority of the

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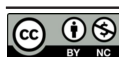
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respondents perceived average score that is about 2 (66.66%), and SD is 6.5. more or less similar respondents perceived poor score that is about 0.5 (16.66%), and SD will be 2.6, and more or less similar respondents perceived good score that is about 0.5 (16.66%) and SD will be 2.6. Medicine UG 3rd year, revealed that majority of the respondents perceived good score that is about 2 (57.14%), and SD is 7.4, and more or less similar respondents perceived very good score that is about 1.5 (42.85%), and SD will be 3.6. Medicine UG 4th year, revealed that majority of the respondents perceived very good score that is about 2 (57.14%), and SD is 7.4, and more or less similar respondents perceived good score that is about 1.5 (42.85%), and SD will be 3.6.

**Conclusion:** The findings of the study revealed that majority of the findings belonged medicine UG 4th year students have very good level of knowledge score, and medicine UG 3rd year students have good knowledge score, and medicine UG 2nd year students have average knowledge score, and medicine UG 1st year students have poor knowledge score compared to other qualification.

#### KEYWORDS:

• Evaluate • Knowledge • Acromegaly • Gigantism • Diabetic Unit.

## INTRODUCTION

Acromegaly and gigantism are rare clinical entities caused by hyper secretion of growth hormone (GH) produced by solid monoclonal somatotrophic pituitary adenoma that occurs sporadically. Sometimes, due to inheritance, mutations of different genes in germline cells occur familiarly or are associated with other conditions and syndromes. Extremely rarely, gigantism and acromegaly result from the production of insulin-like growth factor (IGF-I) from another neoplasm. Gigantism and acromegaly captured attention of people due to their grotesque appearance and great stature as giants. In history, they were often described as mythical creatures of great strength and power. With their pronounced expressive appearance, they were recorded in myths and works of art much earlier than they were of interest to medical practitioners. Despite numerous discoveries from the first descriptions of mechanisms and treatment, over the past two decades, studies related to acromegaly have continued to rise. In this paper, we present gigantism over time, i.e., important turning points from recognition to future insights that occur sometimes nearly simultaneously or with astonishing order in those difficult times, all reminding us of the immense prosperity of medicine and science, as well as the tight connection of surgical and non-surgical fields.<sup>1</sup>

Most somatotrophinomas arise sporadically due to somatic genetic defects. In contrast, germline defects are estimated to explain only

around 5% of all pituitary neuroendocrine tumours. This calculation derives from data obtained almost 20 years ago, based on the frequency of PitNETs presenting in the context of clinical multiple endocrine neoplasia type 1 (MEN1) and familial isolated pituitary adenoma (FIPA). Since then, our knowledge on the genetic drivers of growth hormone (GH) excess has considerably grown. The most common germline driver of familial acromegaly and gigantism, AIP loss-of-function (LOF), was unveiled in 2006. Later, techniques such as next-generation sequencing (NGS) and high-density array-based comparative genomic hybridization (HD-aCGH) facilitated the identification of other disease drivers. Now we know that somatotrophinomas are the most inheritable type of PitNET and that their underlying genetic background includes a couple of common drivers and multiple genes explaining a few cases each. Consequently, the indications and platforms for the routine genetic testing of these individuals have evolved, but genetic analyses are not widely available worldwide. For this reason, and because multiple genetic causes of somatotrophinomas have been recognized quite recently, data on their frequency and associated phenotypes are scarce.<sup>2</sup>

Acromegaly is a rare condition caused by extra pituitary central or peripheral neuroendocrine tumours (NET) that hyper secrete GH or, more commonly, GHRH. It affects less than 1% of acromegaly patients and a misdiagnosis of classic acromegaly can lead to an inappropriate pituitary surgery.

Four types of ectopic acromegaly have been described: Central ectopic GH-secretion: Careful cross-sectional imaging is required to exclude ectopic pituitary adenomas. Peripheral GH secretion: Extremely rare. Central ectopic GHRH secretion: Sellar gangliocytomas immune-histo-chemically positive for GHRH are found after pituitary surgery. 4) Peripheral GHRH secretion: The most common type of ectopic acromegaly is due to peripheral GHRH-secreting NETs. Tumours are large and usually located in the lungs or pancreas. Pituitary hyperplasia resulting from chronic GHRH stimulation is difficult to detect or can be misinterpreted as pituitary adenoma in the MRI. Measurement of serum GHRH levels is a specific and useful diagnostic tool. Surgery of GHRH-secreting NETs is often curative.<sup>3</sup>

## OBJECTIVES

- To evaluate the knowledge level about acromegaly and gigantism among medicine UG students posted at diabetic unit.
- To determine association between knowledge level and selected demographic variables.

## HYPOTHESES

**H1:** There will be no significant association between knowledge level acromegaly and gigantism among medicine UG students posted at diabetic unit.

**H2:** There will be significant association between knowledge level and selected demographic variables.

## ABBREVIATIONS

GH	Growth Hormone
IGF-I	Insulin like Growth Factor-I
MEN1	Multiple Endocrine Neoplasia Type 1
HD-aCGH	High-Density Array-Based Comparative Genomic Hybridization
GHRH	Growth Hormone Releasing Hormone
TSH	Thyroid Stimulating Hormone
ACTH	Adrenocorticotrophic Hormone

## NEED FOR THE STUDY

Most acromegaly patients have pituitary macro adenomas, and 60% of pituitary tumours are pure somatotroph adenomas that secrete only GH. Pituitary adenomas that secrete GH and prolactin are observed in 25% of cases. Adenomas that secrete TSH or

ACTH with GH and carcinomas that secrete GH are rare. Hypothalamic tumours that secrete growth hormone-releasing hormone (GHRH) and pancreatic or bronchial carcinoid tumours may cause acromegaly by triggering an excessive secretion of GH. Due to growth in soft tNumbers and bones, enlargement of the hands and feet and thickening of the fingers are observed in acromegaly patients. The size of shoes and rings may increase. Changes that occur on the face include prominence in the forehead, chin, and cheekbones; thickening of the lips; coarsening of facial lines due to nose widening; and malocclusion. There may be hoarseness in the voice due to hypertrophy in the sinuses and larynx.<sup>4</sup>

Acromegaly is a debilitating and disfiguring chronic disease, which occurs in both sex at any age, associated with multiple comorbidities and increased mortality. It is typically caused by a GH-secreting pituitary adenoma that promotes exposure of body tNumbers to increased concentrations of GH and IGF-I. Moreover, about 25% of the Swedish patients had 10 years or more of diagnostic delay and in this group mortality rate significantly increased.<sup>5</sup>

Gigantism and acromegaly are rare disorders that are caused by excessive GH secretion and/or high levels of its mediator, IGF-1. Gigantism occurs when excess GH or IGF-1 lead to increase linear growth, before the end of puberty and epiphyseal closure. The majority of cases arise from a benign GH-secreting pituitary adenoma, with an incidence of pituitary gigantism and acromegaly of approximately 8 and 11 per million person-years, respectively. Over the past two decades, our increasing understanding of the molecular and genetic etiologies of pituitary gigantism and acromegaly yielded several genetic causes, including multiple endocrine neoplasia type 1 and 4, McCune-Albright syndrome, Carney complex, familial isolated pituitary adenoma, pituitary adenoma association due to defects in familial succinate dehydrogenase genes, and the recently identified X-linked acrogigantism. The early diagnosis of these conditions helps guide early intervention, screening, and genetic counselling of patients and their family members. In this review, we provide a concise and up-to-date discussion on the genetics of gigantism and acromegaly.<sup>6</sup>

## REVIEW OF LITERATURE

In total, 490 consecutive adult patients with acromegaly who were treated at our institution between 1998 and 2014 were included in this cross-sectional study, of which 313 could be contacted. Participants were questioned about their complaints at initial consultation and at the time of diagnosis, the first medical professional who they consulted, interval between onset and diagnosis, and surgeries they had undergone.<sup>7</sup>

Non-interventional patient-reported outcome study. 165 patients with clinically and biochemically proven acromegaly were questioned about the diagnostic process and utilization of health care by means of a self-developed standardized postal survey including questions on acromegaly symptoms experienced before diagnosis, number and specialty of consulted doctors, time to diagnosis and aftercare.<sup>8</sup>

A prospective study using qualitative research methodology and grounded theory. A semi-structured interview was conducted with 18 patients treated for acromegaly in a single tertiary centre and verbatim transcripts were thematically analysed for overarching themes. Acromegaly patients have a strong need for information at the point of initial diagnosis, in particular online resources and interaction with other experienced patients. Wider dissemination of patient educational resources into primary and secondary care settings may improve overall patient satisfaction, treatment adherence and subsequent health care provider-patient relationships.<sup>9</sup>

Qualitative study based on 20 face-to-face unstructured interviews in a third referral Endocrinology centre. Participants, purposively selected until data saturation, were patients with acromegaly with diverse disease durations, types of treatment or associated comorbidities. The data were examined by thematic analysis. Diagnosis of acromegaly requires active medical involvement and awareness. Intervention of patient-experts in medical schools may help to be more aware of this disease.<sup>10</sup>

## MATERIALS & METHODS

**Research Methodology:** Quantitative in nature

**Research design:** Descriptive approach.

**Study Variables:** knowledge level about acromegaly and gigantism among medicine interns posted at diabetic unit.

**Demographic Variables:** Age, gender, religion, and qualification.

**Research setting:** Tertiary care teaching hospital Belagavi.

**Population of the study:** Medicine UG students.

**Sample size:** 25 subjects

**Sampling technique:** Purposive sampling.

**Data collection tool:** The tool consists of 2 sections.

**Section A:** Demographic data of. Medicine interns.

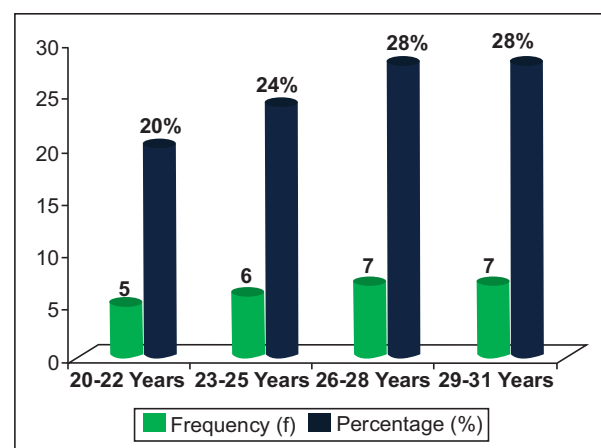
**Section B:** To determine the association between knowledge level about acromegaly and gigantism among medicine UG students posted at diabetic unit.

## RESULTS

**Section A:** Demographic data of. medicine UG students.

**Table 1:** Distribution of respondents accordingly age N=25

Demographic Variables	Frequency (f)	Percentage (%)	Chi-Square
<b>Age</b>			
20-22 Years	5	20	X <sup>2</sup> = 9.02 DF= 9 P Value- 0.41
23-25 Years	6	24	
26-28 Years	7	28	
29-31 Years	7	28	
<b>Total</b>	<b>25</b>	<b>100%</b>	



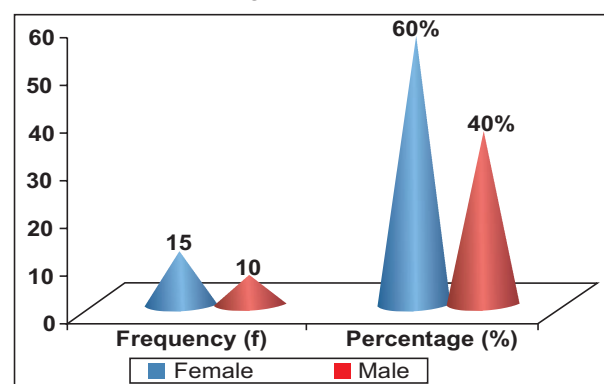
**Graph 1:** Age Distribution

Graph 1, Revealed that majority of the respondents 7 (28%) belonged to the age group of 29-31 years, 7 (28%) belonged to the age group of 26-28 years, 6 (24%) belonged to the age group of 23-25 years, and 5 (20%) belonged to the age group of 20-22 years.

**Table 2:** Distribution of respondents accordingly gender. N=25

Demographic Variables	Frequency (f)	Percentage (%)	Chi-Square
Gender			
Male	15	60	X2= 8.06
Female	10	40	DF= 1
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>P value- 0.58*</b>

\*p value > 0.5 level of significance



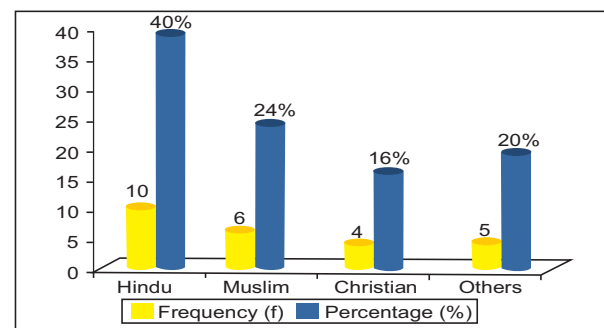
**Graph 2:** Gender Distribution

Graph 2, Revealed that majority of the respondents 15 (60%) belonged to male gender, and 10 (40%) belonged to female gender.

**Table 3:** Distribution of respondents accordingly religion N=25

Demographic Variables	Frequency (f)	Percentage (%)	Chi-Square
Religion			
Hindu	10	40	X2= 9.04
Muslim	6	24	DF= 9
Christian	4	16	P value- 0.52*
Others	5	20	
<b>Total</b>	<b>25</b>	<b>100%</b>	

\*p value > 0.5 level of significance



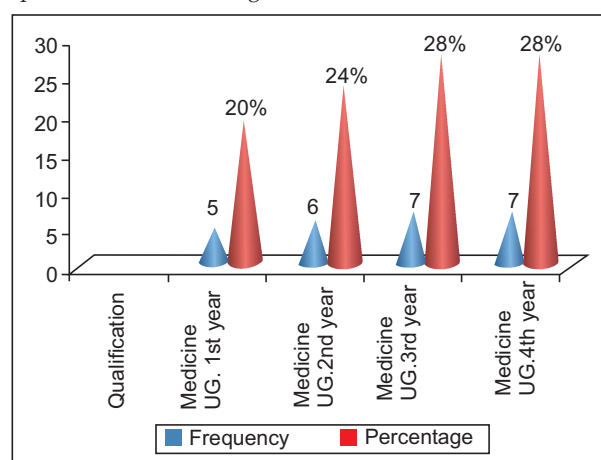
**Graph 3:** Religion distribution

Graph 3, Revealed that majority of the findings 10 (40%) belonged to Hindu, 6 (24%) belonged to Muslim, 4 (16%) belonged to Christian, and 5 (20%) belonged to others.

**Table 4:** Distribution of respondents accordingly qualification N=25

Demographic Variables	Frequency (f)	Percentage (%)	Chi-Square
Qualification			
Medicine UG. 1st year	5	20	X2= 8.04
Medicine UG..2nd year	6	24	DF= 4
Medicine UG. 3rd year	7	28	P value-
Medicine UG. 4th year	7	28	0.57*
<b>Total</b>	<b>25</b>	<b>100%</b>	

\*p value > 0.5 level of significance



**Graph 4:** Qualification distribution

Graph 4, Revealed that majority of the findings 7 (28%) belonged to UG. 4th year students, 7 (28%) belonged to UG 3rd year students, 6 (24%) belonged to UG 2nd year students, and 5 (20%) belonged to UG 1st year students.

**Section B:** To determine the association between knowledge level about acromegaly and gigantism among medicine UG students posted at diabetic unit.

**Table 5:** Knowledge level about acromegaly and gigantism among medicine intern N= 25

Level of knowledge	Obtained score	Frequency (f)	Mean	Mean (%)	SD
<b>Medicine UG 1st Year</b>					
Poor	0-5	2	1	60	6.1
Average	6-10	3	1.5	40	3.5
Good	11-15	0	0	0	0
Very Good	16-20	0	0	0	0
<b>Total</b>		<b>5</b>	<b>2.5</b>	<b>100%</b>	<b>9.5</b>

table cont....

Level of knowledge	Obtained score	Frequency (f)	Mean	Mean (%)	SD
<b>Medicine UG 2nd Year</b>					
Poor	0-5	1	0.5	16.66	2.6
Average	6-10	4	2	66.66	6.5
Good	11-15	1	0.5	16.66	2.6
Very Good	16-20	0	0	0	0
<b>Total</b>		<b>6</b>	<b>3</b>	<b>100%</b>	<b>11.7</b>
<b>Medicine UG 3rd Year</b>					
Poor	0-5	0	0	0	0
Average	6-10	0	0	0	0
Good	11-15	4	2	57.14	7.4
Very Good	16-20	3	1.5	42.85	3.6
<b>Total</b>		<b>7</b>	<b>3.5</b>	<b>100%</b>	<b>11</b>
<b>Medicine UG 4th Year</b>					
Poor	0-5	0	0	0	0
Average	6-10	0	0	0	0
Good	11-15	3	1.5	42.85	3.6
Very Good	16-20	4	2	57.14	7.4
<b>Total</b>		<b>7</b>	<b>3.5</b>	<b>100%</b>	<b>11</b>

Table 5: Revealed that knowledge level in accordance to qualification with mean, mean percentage and standard deviation.

### Medicine UG 1<sup>st</sup> year

Revealed that majority of the respondents perceived poor score that is about 1 (60%), and SD is 6.1. more or less similar respondents perceived average score that is about 1.5 (40%), and SD will be 3.5.

### Medicine UG 2<sup>nd</sup> year

Revealed that majority of the respondents perceived average score that is about 2 (66.66%), and SD is 6.5. more or less similar respondents perceived poor score that is about 0.5 (16.66%), and SD will be 2.6, and more or less similar respondents perceived good score that is about 0.5 (16.66%) and SD will be 2.6.

### Medicine UG 3<sup>rd</sup> year

Revealed that majority of the respondents perceived good score that is about 2 (57.14%), and SD is 7.4, and more or less similar respondents perceived very good score that is about 1.5 (42.85%), and SD will be 3.6.

### Medicine UG 4<sup>th</sup> year

Revealed that majority of the respondents perceived very good score that is about 2

(57.14%), and SD is 7.4, and more or less similar respondents perceived good score that is about 1.5 (42.85%), and SD will be 3.6.

## DISCUSSION

In the present study Table 5: Revealed that knowledge level in accordance to qualification with mean, mean percentage and standard deviation. Medicine UG 1st year, revealed that majority of the respondents perceived poor score that is about 1 (60%), and SD is 6.1. more or less similar respondents perceived average score that is about 1.5 (40%), and SD will be 3.5. Medicine UG 2nd year, revealed that majority of the respondents perceived average score that is about 2 (66.66%), and SD is 6.5. more or less similar respondents perceived poor score that is about 0.5 (16.66%), and SD will be 2.6, and more or less similar respondents perceived good score that is about 0.5 (16.66%) and SD will be 2.6. Medicine UG 3rd year, revealed that majority of the respondents perceived good score that is about 2 (57.14%), and SD is 7.4, and more or less similar respondents perceived very good score that is about 1.5 (42.85%), and SD will be 3.6. Medicine UG 4th year, revealed that majority of the respondents perceived very good score that is about 2 (57.14%), and SD is 7.4, and more or less similar respondents perceived good score that is about 1.5 (42.85%), and SD will be 3.6.

In the similar study, findings in acromegaly was better known by Turkish physicians (96.8%) compared to Asian/African (84.4%) and European (84.5%) physicians ( $p < 0.001$ ). The presence of generalized visceromegaly and excessive sweating was better known by Asian/African physicians ( $p = 0.01$  and  $p = 0.009$ , respectively). The rate of correct answers to the question "Old photographs can be informative in patients suspected to have acromegaly" was higher in the Turkish and Asian/African groups ( $p < 0.001$ ). Only 36.1% of the Turkish physicians, 29.8% of the European physicians, and 31.3% of the Asian/African physicians knew that serum growth hormone (GH) and insulin-like growth factor-1 (IGF-1) levels were diagnostic indicators for acromegaly. Colon cancer and goitre incidences were increased in acromegaly patients. These comorbidities were better known by Asian/African primary care physicians than by Turkish and European primary care physicians ( $p < 0.001$  and  $p = 0.032$ , respectively). Only 18.6% of Turkish and

13% of European physicians knew that surgery was the treatment of choice for acromegaly patients. The rate of correct answers to this question was higher for Asian/African physicians (59.4%) ( $p = 0.003$ ).

## CONCLUSION

The findings of the study revealed that majority of the findings belonged medicine UG 4th year students have very good level of knowledge score, and medicine UG 3rd year students have good knowledge score, and medicine UG 2nd year students have average knowledge score, and medicine UG 1st year students have poor knowledge score compared to other qualification.

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## REFERENCES

1. Malenica M, Trbojevic T, Herceg S, Kukuruzovic M, Šeparović I, Rotim N, Rotim K. Gigantism and Acromegaly through History. *Acta Clinica Croatica*. 2024 October; 63(2):384.
2. Ramirez-Renteria C, Hernandez-Ramirez LC. Genetic diagnosis in acromegaly and gigantism: from research to clinical practice. *Best Practice & Research Clinical Endocrinology & Metabolism*. 2024 May 1; 38(3):101892.
3. Fainstein-Day P, Ullmann TE, Dalurzo MC, Sevlever GE, Smith DE. The clinical and biochemical spectrum of ectopic acromegaly. *Best Practice & Research Clinical Endocrinology & Metabolism*. 2024 May 1; 38(3):101877.
4. Fenercioglu AK, Demircan EU, Can G, Sulu C, Sipahioglu NT, Ozkaya HM, Kadioglu P. Knowledge and attitudes of primary care physicians regarding acromegaly: a survey study with multinational participation. *BMC Primary Care*. 2024 December 30; 25(1):443.
5. Boguszewski CL. Acromegaly: 'You must know it to think of it'. *European Journal of Endocrinology*. 2020 July; 183(1):C1-4.
6. Hannah-Shmouni F, Trivellin G, Stratakis CA. Genetics of gigantism and acromegaly. *Growth hormone & IGF research*. 2016 October 1; 30:37-41.
7. Keskin FE, Yetkin DO, Ozkaya HM, Haliloglu O, Sadri S, Gazioglu N, Tanriover N, Ak H, Hatipoglu E, Kadioglu P. The problem of unrecognized acromegaly: surgeries patients undergo prior to diagnosis of acromegaly. *Journal of Endocrinological Investigation*. 2015 June; 38(6):695-700.
8. Kreitschmann-Andermahr I, Siegel S, Kleist B, Kohlmann J, Starz D, Buslei R, Koltowska-Häggström M, Strasburger CJ, Buchfelder M. Diagnosis and management of acromegaly: the patient's perspective. *Pituitary*. 2016 June; 19(3):268-76.
9. Pak HY, Lansdown A, Taylor P, Rees DA, Davies JS, Hayhurst C. Acromegaly and the information gap: patient perceptions of the journey from primary to tertiary care. *Endocrine connections*. 2020 Oct 1; 9(10):971-7.
10. Sibeoni J, Manolios E, Verneuil L, Chanson P, Revah-Levy A. Patients' perspectives on acromegaly diagnostic delay: a qualitative study. *European Journal of Endocrinology*. 2019 June; 180(6):339-52.