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## BACKGROUND

- Hypoparathyroidism (HPT) is a rare condition in which the parathyroid glands fail to produce enough parathyroid hormone (PTH) or the PTH produced lacks biologic activity.<sup>1</sup>
- Hypoparathyroidism causes a range of symptoms, including neuromuscular, neurological, and cardiovascular issues. In addition to physical symptoms, patients with HPT have reported anxiety, depression, and cognitive symptom such as “brain fog” and an inability to concentrate.<sup>2,3</sup>
- The aim of this study was to explore the patient experience of HPT.

## METHODS

- Qualitative interview data were collected from a mixture of concept elicitation (CE) interviews and the CE section of hybrid CE/cognitive debriefing (CD) interviews.

### Patient Population

- Patients with HPT were recruited via a medical recruitment agency and the United States HypoPARAthyroidism Association.
  - Key inclusion criteria:** Adults aged ≥ 18 years with self-reported HPT for ≥ 12 months currently taking active vitamin D supplements (e.g., calcitriol or alfacalcidol) and supplemental oral calcium treatment (based on self-report).
  - Only patients who were able to speak, read, and understand English and able to participate in web-based, English-language research interview were included.
  - Key exclusion criteria:** Patients with a self-reported history of autosomal-dominant hypocalcemia or pseudohypoparathyroidism, or those dependent on regular parenteral calcium infusions (e.g., calcium gluconate) to maintain calcium homeostasis (based on self-report) or with self-reported previous treatment with PTH-like drugs—including PTH(1-84), PTH(1-34), or abaloparatide—within 3 months prior to screening for CE interviews and within 1 month prior to screening for the hybrid CE/CD interviews were excluded from the study.

### Qualitative Interviews and Analysis

- The qualitative interviews were reviewed by and granted approval from RTI International’s Institutional Review Board (STUDY00021403).
- A semi-structured interview guide was developed. The qualitative interviews explored the patient experience of symptoms associated with HPT and health-related quality of life (HRQOL) impacts of living with HPT.
- Interviews were audio recorded, and transcripts were produced.
- Patient sociodemographic data were obtained from a sociodemographic questionnaire.
- Thematic analysis was conducted to evaluate key areas of symptomatic and HRQOL impact from the patient perspective. Each transcript was coded using a coding frame (developed based on the interview guide) and was subjected to one primary and one secondary quality-review encoding.
- Transcripts were analyzed until coding saturation was reached.

## RESULTS

### Sample Characteristics

- Qualitative interviews were conducted with 16 patients who self-reported having HPT for ≥ 12 months (10 CE interviews and 6 hybrid CE/CD interviews).
- The mean (standard deviation) age of the patients was 50.0 (15.3) years (range, 26-76); 94% of the patients were female, 81% were White, and 25% were employed full-time. 63% of patients were married, and 75% had attained a college graduate/bachelor’s degree or above.
- 56% of patients reported that their HPT was caused by surgery. The mean (standard deviation) length of HPT diagnosis reported was 11.0 (11.4) years (range, 1 year and 3 months to 46 years). 50% of patients reported that their health was “good,” but 75% reported their severity HPT as “moderate,” and 50% reported that their life was affected “a lot” by their HPT.
- A total of 32 comorbid health conditions were reported by patients; hypothyroidism (81%) and thyroid disease (75%) were the most frequently reported comorbidities.

## RESULTS (continued)

### Diagnosis

Obtaining an HPT diagnosis was reported as a challenging and frustrating process due to the relative rarity of HPT.

- Patients reported that healthcare providers were often unfamiliar with HPT and did not recognize the importance of symptoms.
- Patient emotional responses to HPT diagnosis included acceptance, anger, depression, devastation, disbelief, frustration, relief, shock, and general upset.
- Patients were initially naive to the permanency and gravity of their HPT diagnosis as well as the implications that this condition would have on their lives.

“At first, I didn’t think it was a big deal, but later, I realized how much it would affect my life.”  
Female, age 76 years

### Patient Symptom Experience

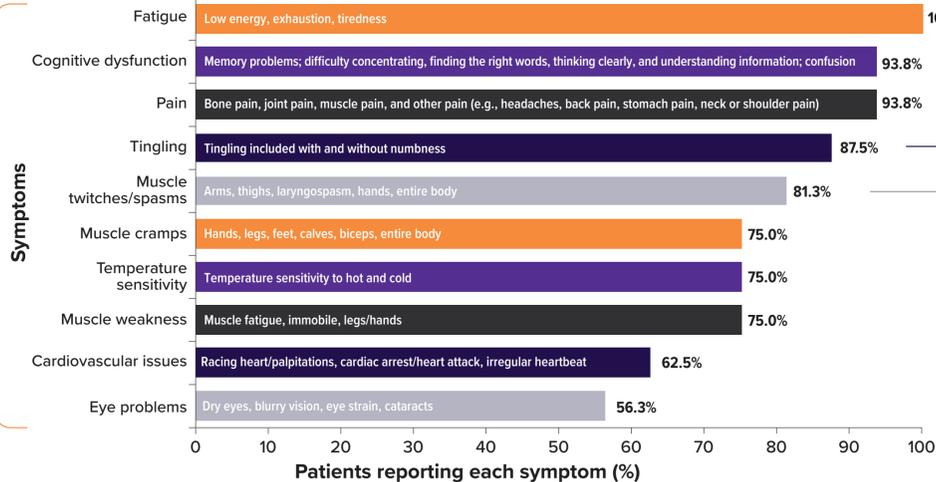
- Figure 1 presents the key HPT symptoms reported by patients and the key terms associated with each symptom.

- Fatigue, cognitive dysfunction and muscle spasms/cramps (including laryngospasm) were frequently reported as the most severe symptoms.
- The symptoms that restricted patients’ lives (e.g., fatigue, muscle weakness, and cognitive dysfunction) or those that resulted in considerable pain and discomfort (e.g., muscle cramps) were reported as the most bothersome/most concerning.

Symptoms associated with long-term use of calcium medications (i.e., kidney disease, calcium deposits) were also of concern to patients.

With no patient-perceived clear treatment pathway or direct method for patients to monitor their calcium levels, patients were uncertain about the most appropriate response to the onset of these symptoms (i.e., additional medication, stop medication, or seek medical attention)

Figure 1. Symptom Experience Reported by Patients With HPT (N = 16)



“So I guess if I was to sum it up, it’s like having...it’s very invisible. I feel like every symptom I have is invisible. So I feel like I go through the day either in a lot of pain with muscle spasms or numbness, tingling, brain fog, fatigue, and these are all things that somebody cannot see.”  
Female, age 27 years

“The fatigue and the...that’s the biggest one because if you can’t stay awake, you can’t get anything done. Pain hurts and may be tough to do something, but it doesn’t stop you from being able to function.”  
Female, age 39 years

“The brain fog was really just memory issues where it could take me hours and hours to remember a simple word.”  
Female, age 43 years

“I get generalized pain. And it varies. If I’ve overexerted, it can be in my lower back. It can be in my legs. Sometimes it’s in my shoulders.”  
Female, age 47 years

“I can tell when my mouth is getting...when my calcium’s getting too low, it’ll feel very strange and tingling, burning.”  
Female, age 64 years

“I have a hard time with this word...laryngospasms...where your vocal cords have spasms and close your airway off.”  
Male, age 61 years

14 TIMES Patients experienced intra-day symptom variability and unpredictability depending on treatment regimen.

This erratic symptom experience hindered daily planning and interactions with family/friends, resulting in emotional distress (e.g., anxiety and frustration).

“It’s that level of frustration. It’s a crazy gremlin. It’s a gremlin that shows up sporadically and in different forms. It’s like a shape-shifter.”  
Female, age 66 years

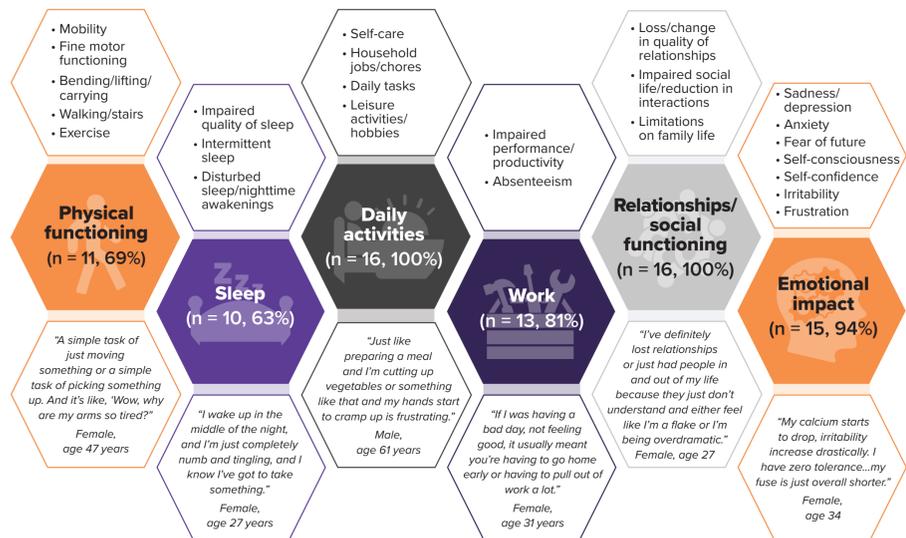
“The fact that it’s hard to know what your next day’s going to be like. When you wake up, it’s like I can be completely fine, and then I can just have fatigue and not be able to do anything the rest of the day.”  
Female, age 31 years

### Patient Experience of Living With HPT: Impact on Patient HRQOL

Patients reported that HPT had a detrimental impact on every aspect of their daily lives and HRQOL (Figure 2).

“It’s ruined my life...I mean, it’s changed my life dramatically.”  
Female, age 60 years

Figure 2. Symptom Experience Reported by Patients With HPT (N = 16)



One of the key impacts on patients’ emotional well-being was the patient-perceived “invisibility” of HPT—specifically patients’ disease experience was often dismissed by family/friends as HPT is rare with no “visible” symptoms.

- As a rare condition with no “visible” symptoms, HPT is unfamiliar to most of the general population, which creates challenging scenarios for patients (e.g., explaining limitations or behaviors associated with their HPT to family and friends).
- Patients note that their symptoms and disease experience are often dismissed or disbelieved by their friends and family due to a lack of understanding.

“Just feeling like I have an invisible illness that nobody can see.”  
Female, age 27 years

“Meanwhile, people don’t...think it’s a made-up disease. They don’t...and they’ve never heard of it. It’s so rare, and they think I’m just making it up. So they’re not very...nobody’s knowledgeable about it, and they certainly don’t want to learn about it.”  
Female, age 26 years

“It’s like an invisible thing where you can’t explain it to someone. If I say even to a doctor, to tell you the truth, ‘My calcium is low. I’m having issues,’ they look at you like you have psychiatric issues. They don’t get it.”  
Female, age 60 years

### Patient HPT Treatment Experience: Burden of Management

Patients also noted the burden of HPT management (e.g., treatment regimens, potential effects from long-term medication use).

- Patients used medications and supplements to treat their HPT every day and generally with unflinching regularity at the same time of day.
- The need for constant vigilance associated with symptom monitoring and medication use could be onerous for patients.
- The absence of “at-home calcium monitoring” required patients to adhere to self-imposed medication timetables; any deviations caused emotional distress as patients feared triggering a “calcium crash.”
- 7 patients noted that treatment effects were not sustained throughout the day, leading to a re-emergence of symptoms as the day progressed.

“I didn’t get in the swings that you do with the calcitriol and the calcium, which is part of the reason I have to take it so many times a day is kind of keep that balance. Otherwise, I kind of get that rollercoaster effect, and my calcium levels drop.”  
Female, age 34 years

“Yes, because unfortunately, oral calcium wears off, and you use your muscles, all of them, all day, everyday, and you burn through that oral calcium quickly.”  
Female, age 47 years

Symptom reduction, improved treatment, and the opportunity to self-monitor calcium levels at home were identified as key factors that patients wanted to change about their HPT. Patients perceived that these changes would improve their well-being and quality of life and provide more control of their own lives.

“That there would be better treatment and monitoring and just, I guess, less symptoms so the quality of life could be better.”  
Female, age 27 years

“I would change the fact of making it more manageable. And I know...that is far-fetched and far-reaching, and I don’t think we’ll ever get there. But to be able to manage it in the way of having a better quality of life.”  
Female, age 47 years

## CONCLUSIONS

- The interviews provided valuable insights on the patient-lived experience of HPT. Patients’ lives were significantly disrupted by their HPT symptoms regardless of treatment regimen.
- Important impacts of HPT included key symptoms (e.g., fatigue and cognitive dysfunction) limitations on their daily lives, impaired sleep, and interactions with their family and friends.
- This disruption was exacerbated by the unpredictability of symptoms, which challenged patients’ ability to live their lives.
- These findings highlight the need for durable effective treatment for patients with HPT.

### Acknowledgments

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