

Original Article

The Effects of Patient Characteristics on the Management of Subclinical Hypothyroidism: A Survey of Faculty and Trainees

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ABSTRACT

Objective: There is no universal approach to the management of subclinical hypothyroidism (SCH). This study was designed to determine the impact of patient characteristics on management decisions in SCH amongst physician faculty members and trainees.

Methods: An online survey was distributed to faculty members and medical trainees (ie, interns, residents, and fellows) at multiple academic medical centers. The survey included 9 clinical scenarios describing women with SCH with 5 management options sequenced from most “conservative” (no further treatment or monitoring) to most “aggressive” (treatment with levothyroxine).

Results: Of the 194 survey respondents, 95 (49.0%) were faculty members and 99 (51.0%) were trainees. Faculty members were more likely to report being “confident” or “very confident” in making the diagnosis of SCH compared to trainees (95.8% vs 46.5%, $P < .001$). Faculty members were also more likely to consider patient preference for treatment (60.0% vs 32.3%, $P < .001$). Among all respondents, the clinical factors that resulted in the highest predicted probability of treatment were hypothyroid symptoms (predicted probability [PP] 68.8%, 95% CI [65.7%-71.9%]), thyroid stimulating hormone >10 mIU/L in a 31-year-old (PP 63.9%, 95% CI [60.3%-67.3%]), and the desire for fertility (PP 52.2%, 95% CI [48.6%-56.0%]). In general, faculty members favored more aggressive treatment across all clinical scenarios.

Conclusion: The presence of symptoms, thyroid stimulating hormone >10 mIU/L, and desire for fertility were most predictive of the decision to treat in SCH. In several clinical scenarios, both trainee and faculty decision-making demonstrated discordance with general SCH management principles.

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Introduction

Subclinical hypothyroidism (SCH) is a common thyroid disorder defined by a thyroid stimulating hormone (TSH) level above the

Abbreviations: CI, confidence interval; CS, clinical scenario; FT4, free thyroxine; HTN, hypertension; LT4, levothyroxine; OR, odds ratio; PP, predicted probability; SCH, subclinical hypothyroidism; TPO, thyroperoxidase; TSH, thyroid stimulating hormone.

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upper limit of the normal range with a normal free thyroxine (FT4) level. The estimated prevalence of SCH ranges from 3% to 15%, with a higher prevalence in females and elderly individuals.¹⁻³ Untreated SCH has been associated with cardiovascular disease, stroke, reproductive abnormalities in women, neuropsychiatric symptoms, and progression to overt hypothyroidism.⁴⁻⁶ However, the impact of SCH on health outcomes for patients appears to be a function of the degree of TSH elevation, patient age, pregnancy status, amongst other clinical factors.⁷ As a result, there are no unifying diagnostic or treatment criteria for SCH for all patients. The decision to treat relies on consideration of individual patient characteristics including TSH level, hypothyroid symptoms, presence of thyroid

antibodies, and other co-morbidities. However, there are a set of general SCH management principles that have been endorsed in multiple clinical guidelines,⁸⁻¹¹ which are summarized below.

- 1) An elevated serum TSH level should be repeated (with or without a FT4 level) between 1 and 3 months after initial testing to confirm the diagnosis of SCH.⁸
- 2) A patient with a confirmed TSH level ≥ 10 mIU/L in most cases should receive treatment due to increased cardiovascular risk.^{9,10}
- 3) Treatment of SCH in pregnancy is recommended when the TSH level is ≥ 10 mIU/L, or above the upper limit of normal in the presence of thyroperoxidase (TPO) antibodies.¹¹
- 4) Treatment of SCH when the TSH level is < 10 mIU/L (or < 20 mIU/L in some cases with older patients¹²) should be determined on an individual basis.

In the setting of mild SCH when the TSH level is < 10 mIU/L, the decision to treat with levothyroxine (LT4) is not without potential harm. Patients treated with LT4 must take a pill every day and require thyroid function testing at least annually. Overtreatment with LT4 can result in subclinical or overt thyrotoxicosis, increasing risk for bone loss, cardiovascular morbidity, and neuropsychiatric symptoms in elderly patients.¹³⁻¹⁶ Despite these risks, about 80% of LT4 prescriptions in the US are offered to patients with a TSH < 10 mIU/L.¹⁷ For efforts to minimize the potential harm from inappropriate LT4 treatment, it is important to understand the clinical decision-making process in the management of SCH.

Prior surveys exploring clinicians' management of hypothyroidism have identified several patient characteristics that significantly impacted clinical decision-making, including age, the duration of TSH elevation, the presence of thyroid antibodies, and patient interest in receiving treatment.¹⁸⁻²⁰ A survey of clinicians from a range of countries identified that physicians from North America may be more likely to prescribe LT4 in borderline cases.²¹ Clinicians practicing in the Middle East and Africa were also found to have a low threshold for treating mild elevations in TSH, although there was variation in the treatment rate.²² Further, it is possible that clinicians of varying experience levels may differ in their decision-making process. The degree to which physician experience level (eg, trainee vs faculty) affects treatment decision-making remains unknown.

In this study, we surveyed faculty physicians and medical trainees (ie, interns, residents, and fellows) to examine decision-making for the management of SCH amongst clinicians of varying experience levels. Overall, our study aims were to, 1) understand the impact of specific patient characteristics on management decisions in SCH, in particular the decision to treat and 2) determine whether decision-making differs between trainees and faculty physicians.

Material and Methods

Survey Development and Clinical Scenarios

An English language survey was distributed electronically to faculty and medical trainees at multiple academic medical centers (University of Chicago, University of Michigan, University of California San Diego, and University of Pittsburgh). An anonymized link to the electronic survey was distributed via email to potential respondents. Survey data were collected and stored using a secure, web-based research application (REDCap). At the primary institution (University of Chicago), the survey link was distributed to faculty and trainees within the specialties most likely to encounter SCH regularly, including: general medicine, family medicine,

Highlights

- Thyroid stimulating hormone (TSH) level, symptoms, and clinical state were top treatment considerations for subclinical hypothyroidism (SCH).
- Desire for fertility, TSH > 10 mIU/L and symptoms were top reasons to prescribe LT4.
- Variability existed between how physicians chose to manage SCH in many cases.
- Medical trainees were less likely to consider patient preference for treatment.

Clinical Relevance

The management of subclinical hypothyroidism remains an area of increased debate and research. This study provides insight into how physicians approach the decision to treat patients with subclinical hypothyroidism. Furthermore, it reveals that both faculty members and trainees may make decisions in SCH management that are differ from standard clinical guidance.

obstetrics, medical specialties, and endocrine surgery. At the partner institutions, the survey was distributed to general medicine faculty members and internal medicine trainees. Using best practice survey response rates to calculate the number of eligible respondents, the estimated completed survey response rate was 19.2% amongst trainees and 16.5% amongst faculty members.²³ The survey consisted of a total of 17 questions divided into 3 sections: general, clinical scenarios, and participant demographics. The general questions assessed confidence in making the diagnosis of SCH and asked participants to select patient characteristics that may influence the decision to treat SCH with LT4.

The second survey section consisted of 9 clinical scenarios that varied by 1 or 2 patient factors from the index patient in order to isolate the effect of an individual patient characteristic on clinical management response. The index patient was a 31-year-old woman with no symptoms, no past medical history, no desire for fertility, and no abnormal physical exam findings. Her TSH level at the time of the visit was 7.0 mIU/L with a FT4 of 1.2 ng/dL. Standard thyroid function reference ranges were provided. Clinical scenarios varied by patient age, TSH level, desire for fertility, presence of hypothyroid symptoms, and presence of cardiovascular risk factors (hypertension and obesity). For each clinical scenario, the participant selected 1 of 5 management options: 1) no further treatment or monitoring, 2) monitor for symptoms and recheck TSH annually, 3) recheck TSH and FT4 in 1 to 2 months (or during the first trimester of pregnancy if the patient was seeking fertility), 4) check anti-TPO antibodies and start hormone replacement if positive, and 5) begin treatment with LT4. The management options were designed to capture common approaches to a patient with an elevated TSH level and were ordered from more conservative (ie, no treatment or monitoring) to more aggressive (ie, treat without further testing). The appropriateness of the clinical scenarios and management options were determined after a review of the current literature and evaluated by 2 clinical experts in hypothyroidism. Because these options cannot capture the broad spectrum of clinical practice, the respondents were instructed to choose, in their own judgment, the best option of those available. Cronbach's alpha was used to measure the reliability of the clinical scenario survey section, with an acceptability threshold of ≥ 0.70 . The study was deemed exempt from review by the institutional review board at the University of Chicago.

Statistical Analysis

The primary analysis was performed to determine how differences in patient characteristics affect physician management decisions of SCH. Management responses for each clinical scenario were presented as a percentage of all participants. To determine the effect of each patient characteristic on the likelihood of choosing to treat the patient, the responses were dichotomized to choosing to treat (option 5) vs not treating (options 1-4). The binary response variable was modeled on clinical scenario and clustered by individual participant using a generalized linear mixed-effects approach for repeated measures. This approach was chosen to account for variability in decision-making between participants. The likelihood to treat by clinical scenario is presented as predicted probability. 95% CI were estimated using a bootstrap resampling technique with 1000 resamples.

A secondary analysis was performed to identify differences in how medical trainees and faculty members approach the management of SCH. To perform this analysis, level of practice was dichotomized to binary trainee status: medical trainee (ie, intern, resident, or fellow) vs faculty member. Differences between faculty and trainees in response to the general survey questions, management responses to each clinical scenario, and demographic characteristics were assessed using the χ^2 test. The repeated measures approach described above was modified by stratifying by trainee status to determine the difference in predicted probabilities of choosing to treat in each clinical scenario between faculty and trainees. Ordering of the response from conservative to aggressive management strategies allowed for univariate and multivariable ordinal regression approaches to estimate the effect of trainee status on the management decision in each clinical scenario. Covariates included participant sex, race/ethnicity, and specialty of the respondents. Results were presented as ORs with 95% CI. Data manipulation and statistical analysis were completed using R statistical software (version 4.1.2).

Results

The survey was completed by 194 physicians, of which 95 (49.0%) were faculty members and 99 (51.0%) were medical trainees. The respondent population was majority female (60.9%) and identified as non-Hispanic white (68.0%). The majority of both faculty members (59.6%) and trainees (81.6%) described their current practice or training program specialty as internal medicine or general medicine (Table 1). The majority of respondents (70.6%) described their level of confidence in diagnosing SCH as “confident” or “very confident” (Table 2). Regarding patient characteristics considered when deciding to prescribe thyroid hormone, the top 3 characteristics were the presence of hypothyroid symptoms (85.1%), degree of TSH elevation (79.9%), and current clinical state (eg, critical illness) (69.6%) (Table 3).

Responses to Clinical Scenarios

The patient characteristics and participant responses in each clinical scenario are outlined in Table 4. Cronbach's alpha was calculated at 0.76 (95% CI [0.69-0.81]), above the threshold for acceptable internal survey consistency. As expected, participant responses varied based on changes in the clinical scenario. In the clinical scenario in which the patient first presents with an abnormal TSH (CS 1), approximately 51.8% of respondents chose to recheck TSH and FT4 in 1 to 2 months. In the clinical scenarios with 2 confirmed abnormally high TSH levels, desire for fertility (CS 3), presence of hypothyroid symptoms (CS 4), and 2 TSH levels >10

Table 1
Demographic Characteristics of Survey Participants

Participant characteristics	All respondents	Faculty members	Trainees	P value
	n = 194	n = 95	n = 99	
Sex (%)				.004
Female	60.9	72.0	50.5	
Race/ethnicity (%)				.089
White	68.0	73.7	62.6	
Black or African American	2.1	0.0	4.0	
Asian	21.1	16.8	25.3	
Other	5.2	4.2	6.1	
Prefer not to answer	3.6	5.3	2.0	
Identify as Hispanic/Latino (%)				.852
Yes	4.7	4.3	5.1	
No	92.7	92.6	92.9	
Prefer not to answer	2.6	3.2	2.0	
Level of practice				-
Intern	13.4	-	26.3	
Resident	33.5	-	65.7	
Fellow (medical specialty)	4.1	-	8.1	
Faculty practicing <5 y	9.8	20	-	
Faculty practicing 5-10 y	10.8	22.1	-	
Faculty practicing 10-20 y	11.3	23.2	-	
Faculty practicing >20 y	17.0	34.7	-	
Specialty/training program (%)				<.001
Internal medicine/General medicine	70.8	59.6	81.6	
Family medicine	12.0	19.1	5.1	
Obstetrics/gynecology	1.6	0.0	3.1	
Medical specialty	11.5	18.1	5.1	
Surgical specialty	1.0	0.0	2.0	
Other	3.1	3.2	3.1	
Current specialty of faculty members (%)				-
Primary care/General medicine	78.5	78.5	-	
Endocrinology	10.8	10.8	-	
Geriatrics	7.5	7.5	-	
Gastroenterology	2.2	2.2	-	
Other	1.1	1.1	-	

Table 2
Confidence in Making the Diagnosis of Subclinical Hypothyroidism

Confidence level (%)	All respondents	Faculty members	Trainees	P value
	n = 194	n = 95	n = 99	
Very confident	22.7	40.0	6.1	<.001
Confident	47.9	55.8	40.4	
Neutral	18.0	3.2	32.3	
Not very confident	11.3	1.1	21.2	

mIU/L (CS 5) prompted a majority of respondents to treat with LT4 without further testing (51.6%, 66.8%, and 62.5% of respondents, respectively). The presence of hypertension and obesity in a patient (CS 6) prompted a spread of responses, with 36.6% choosing to monitor and repeating TSH testing annually and 27.2% choosing treatment without further testing. In the clinical scenarios featuring a 72-year-old woman (CS 7-9), 2 TSH levels >10 mIU/L prompted 51.8% of respondents to choose treatment without further testing. The results of the repeated measures analysis estimating the likelihood to treat by clinical scenario were similar to those discussed above (Fig.). The predicted probability of treatment was greatest in the cases of desire for fertility (CS 3; PP 52.2%, 95% CI [48.6%-56.0%]), hypothyroid symptoms (CS 4; PP 68.8%, 95%

Table 3
Patient Characteristics Considered When Deciding to Prescribe Thyroid Hormone Replacement

Patient characteristics (%)	All respondents	Faculty members	Trainees	P value
	n = 194	n = 95	n = 99	
Age	55.7	60.0	51.5	.296
Comorbidities	63.9	68.4	59.6	.258
Current clinical state (eg, critical illness)	69.6	60.0	78.8	.007
Degree of elevation of TSH	79.9	88.4	71.7	.006
Patient preference	45.9	60.0	32.3	<.001
Prior abnormal TSH	39.7	43.2	36.4	.412
Presence of symptoms	85.1	84.2	85.9	.904
Sex	4.6	2.1	7.1	.193

Abbreviation: TSH = thyroid stimulating hormone.

Table 4
Faculty Member and Trainee Responses to Clinical Scenarios

Patient characteristics	Clinical scenario								
	1	2	3	4	5	6	7	8	9
Sex	Female	Female	Female	Female	Female	Female	Female	Female	Female
Age (y)	31	31	31	31	31	31	72	72	72
Current TSH level (mIU/L)	7.0	7.0	7.0	7.0	12.1	7.0	7.0	12.1	7.0
Current FT4 level (ng/dL)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Prior TSH level	3.6	6.8	6.8	6.8	10.4	6.8	6.8	10.4	6.8
Desire for fertility	No	No	Yes	No	No	No	NA	NA	NA
Weight gain, depressed mood	No	No	No	Yes	No	No	No	No	No
History of HTN and obesity	No	No	No	No	No	Yes	No	No	Yes
Participant responses (%)									
No further treatment or monitoring	5.7	11.4	2.6	1.6	2.6	5.8	18.8	4.1	8.2
Monitor for symptoms, recheck TSH annually ^a	26.4	52.8	19.3	7.3	12.0	36.6	61.3	17.1	48.5
Re-check TSH and FT4 in 1-2 mo	51.8	9.3	11.5	8.8	8.3	12.6	7.9	16.1	11.9
Check anti-TPO antibodies and start LT4 if positive	13.0	18.1	15.1	15.5	14.6	17.8	7.3	10.9	11.3
Begin treatment with LT4	3.1	8.3	51.6	66.8	62.5	27.2	4.7	51.8	20.1

Abbreviations: FT4 = free T4; HTN = hypertension; LT4 = levothyroxine; TPO = thyroid peroxidase; TSH = thyroid stimulating hormone.

^a For clinical scenario 3, response was modified to recheck TSH during first trimester of pregnancy. All TSH levels are in mIU/L. Provided reference ranges: TSH: 0.4 to 4.4 mIU/L; FT4: 0.9 to 1.7 ng/dL.

CI [65.7%-71.9%]), and TSH >10 mIU/L in a 31-year-old (CS 5; PP 63.9%, 95% CI [60.3%-67.3%]).

Comparison of Faculty Member and Trainee Responses

Demographically, more faculty members were female compared to trainees (72.0% vs 50.5%, $P = .004$) (Table 1). Regarding specialization, about 60% of faculty members considered themselves to be in internal/general medicine practice, compared to 81.6% of trainees (in internal medicine programs) ($P < .001$). There was no significant difference in race/ethnicity between the 2 groups.

Faculty members were significantly more confident in making the diagnosis of SCH compared to trainees (95.8% vs 46.5%, $P < .001$) (Table 2). Small differences emerged in the proportion of faculty members vs trainees that would take certain patient characteristics under consideration when deciding to prescribe thyroid hormone for SCH, including current clinical state of the patient and degree of TSH elevation (Table 3). Of note, 60.0% of faculty members reported taking patient preference into consideration when deciding whether to treat with thyroid hormone, compared to just 32.3% of trainees ($P < .001$).

Several differences emerged in how faculty members and trainees responded to the clinical scenarios (Supplementary Table 1). In the desire for fertility scenario (CS 3), faculty members more often favored treatment over additional testing compared to trainees (65.6% vs 38.4%, $P = .005$). For the 72-year-old woman with a TSH of 7.0 and no symptoms or cardiovascular risk factors (CS 7),

more trainees selected “no further treatment or monitoring” (28.3%) than faculty (8.7%) ($P = .003$). No other significant differences were identified. Similar results were found in the repeated measures analysis (Supplementary Fig. 1). Of note, there was a general trend throughout all scenarios that trainees were less likely to treat compared to faculty members.

Univariate and multivariable ordinal regression modeling of the effect of training status on response to each clinical scenario provided similar results. In general, being a trainee decreased the likelihood of selecting more aggressive management strategies (ie, trainees were less likely to check thyroid function with a close follow up, check TPO and treat, or treat without additional testing relative to faculty members). Specifically, trainee decision-making significantly favored conservative management compared to faculty in CS 3, CS 7, and CS 8, with estimated ORs of 0.43 (95% CI [0.23-0.80]), 0.40 (95% CI [0.21-0.78]), and 0.47 (95% CI [0.25-0.88]), respectively (Table 5).

Discussion

In this survey study, we found that the presence of hypothyroid symptoms, degree of TSH elevation, and current clinical state were the most common patient characteristics physicians considered when managing SCH. The majority of participants chose to treat patients who presented with hypothyroid symptoms, TSH level >10 mIU/L (at age 31 or 72 years), and those with a desire for fertility. Faculty physicians were overall more confident than trainees in diagnosing SCH and were more likely to consider patient

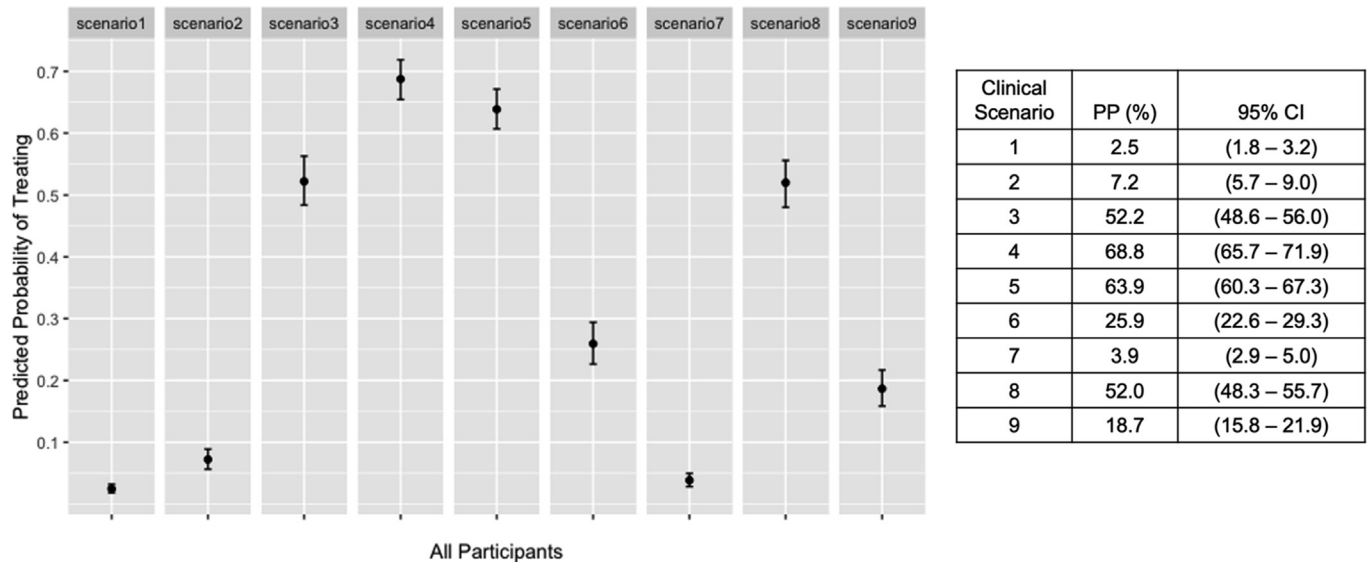


Fig.. Predicted probabilities of treatment of SCH by all participants by clinical scenario. Error bars represent estimated 95% confidence interval via bootstrap resampling technique. CI = confidence interval; PP = predicted probability; SCH = subclinical hypothyroidism.

Table 5

The Effect of Trainee Status on the Selection of Management Choice by Clinical Scenario via Ordinal Regression

Clinical scenario	Univariate analysis			Multivariable analysis		
	OR	95% CI	P-value	OR	95% CI	P-value
1. 31 y of age, TSH 7.0, prior TSH 3.6	0.86	[0.50-1.47]	.291	0.74	[0.40-1.35]	.331
2. 31 y of age, TSH 7.0	0.79	[0.46-1.34]	.381	0.76	[0.41-1.41]	.389
3. 31 y of age, TSH 7.0, desire for fertility	0.36	[0.21-0.63]	<.001	0.43	[0.23-0.80]	.007
4. 31 y of age, TSH 7.0, weight gain and depressed mood	1.09	[0.61-1.96]	.777	0.93	[0.48-1.80]	.820
5. 31 y of age, TSH 12.1, prior TSH 10.4	0.54	[0.30-0.95]	.033	0.64	[0.33-1.24]	.187
6. 31 y of age, TSH 7.0, history of hypertension and obesity	0.89	[0.53-1.48]	.652	0.93	[0.52-1.69]	.818
7. 72 y of age, TSH 7.0	0.55	[0.31-0.98]	.044	0.40	[0.21-0.78]	.007
8. 72 y of age, TSH 12.1, prior TSH 10.4	0.50	[0.29-0.86]	.012	0.47	[0.25-0.88]	.019
9. 72 y of age, TSH 7.0, history of hypertension and obesity	1.03	[0.61-1.74]	.908	0.85	[0.47-1.55]	.609

Abbreviations: CI = confidence interval; FT4 = free T4; OR = odds ratio; TSH = thyroid stimulating hormone.

Responses were ordered from most to least conservative. Thus an OR <1 signals being a trainee favored a more conservative approach. In all scenarios, the patient is female and has a FT4 of 1.2 ng/dL prior TSH level of 6.8 mIU/L unless indicated otherwise. Multivariable analysis included sex, race/ethnicity, and specialty as covariates. All TSH levels are in mIU/L. Bold values indicate a significance to P-value <.05.

preferences in their decision-making. Overall, there was variation in responses across all clinical scenarios amongst faculty and trainees, with both groups demonstrating a notable degree of discordance with the general management principles of SCH in some clinical scenarios.

The lower degree of confidence demonstrated by medical trainees in the diagnosis of SCH aligns with prior observations of the management of other chronic diseases. Medical trainees tend to be exposed to more acute issues and fewer chronic conditions in general practitioner training.²⁴ A survey of US physicians also found that the majority reported chronic disease training was less than adequate.²⁵ Similar studies of medical trainees' confidence in the diagnosis and management of diabetes have found lower confidence levels across multiple training groups and in a variety of clinical scenarios.^{26,27} We believe the lower confidence reported by trainees in this study may be the result of both the relative lack of training in chronic disease management and the ambiguity that remains within the clinical guidelines offered in SCH management. However, we cannot exclude the possibility of responder bias in which trainees may downgrade confidence in decision-making (alternatively, faculty members may upgrade confidence) due to perceived expectations of medical knowledge.²⁸

It is also noteworthy that trainees were less likely to consider patient preference in deciding whether to treat SCH. While patients and providers may prefer a shared decision-making approach due to more confidence in decisions and more patient involvement,^{29,30} this may result in a proportion of patients receiving treatment that provides little to no benefit. Due to the lack of a universal management approach for SCH, more experienced physicians may weigh patient preference more heavily in the decision-making process, while trainees and junior faculty may be more likely to adhere more strictly to guidelines. Additionally, trainees were more likely to consider the overall clinical condition of the patient when considering treatment decisions, which is necessary to avoid misdiagnosing euthyroid sick syndrome as SCH in the setting of critical illness.³¹

The decision-making of faculty members and trainees differed for several important clinical scenarios. However, because there is no universal approach to SCH management, there is no measure of which group made "better decisions". In CS 3 (desiring fertility), 66% of faculty vs 38% of trainees chose to treat a woman trying to conceive with a TSH of 7 mIU/L, highlighting a key difference in decision-making between the 2 groups. While overt hypothyroidism is more clearly associated with risk of fertility problems and

pregnancy complications, there is evidence that SCH may be related to adverse obstetric outcomes such as pregnancy loss, preterm birth, and poor neonatal health outcomes depending on degree of TSH elevation.³² Further, 2 large retrospective studies have found that LT4 treatment was associated with improved obstetrical outcomes when TSH is >4 mIU/L.^{33,34} However, the current American Thyroid Association pregnancy guidelines recommend treatment in the context of SCH and infertility when TSH is >10 mIU/L or above the upper limit of normal when TPO antibodies are present.¹¹ In CS 5 (31 year old with 2 TSH levels >10 mIU/L), 57% of trainees vs 69% of faculty chose treatment. Most clinical guidelines would recommend treatment in this scenario. Conversely, in CS 7 (72-year-old with a TSH level of 7 mIU/L), some experts would consider this an age-appropriate TSH level,^{35,36} however 91.3% of faculty and 71.7% of trainees opted for some degree of further testing/monitoring. Ultimately, given the variation in responses across all clinical scenarios, it is important to recognize that both faculty and trainees, in multiple clinical scenarios, were discordant from the general management principles featured in clinical guidelines.

This study has several limitations. First, the survey participants all practiced at academic centers, so the results may not be generalizable to physicians practicing in the nonacademic setting. The study did include participants from multiple centers, and thus was more likely to capture a diverse set of practice styles. Second, endocrinologists were overrepresented in the faculty group, perhaps due to their comfort with the subject of the survey. It is possible that the faculty confidence levels were partially inflated as a result. Third, the clinical scenarios posed in this survey were designed as a sample of possible clinical presentations, but were simplified for the benefit of the survey participants to promote survey completion. The physicians surveyed may behave differently in practice with a full medical history and exam. Furthermore, the multiple choice format did not allow for all possible management options. Physicians were asked to choose the best option available, which may not have completely aligned with their true practice behavior. However, the analysis of the responses emphasized the decision to treat and the trend from more conservative to aggressive management more so than individual responses. Finally, the level of practice was dichotomized to trainees and faculty members, which placed physicians of varying experience levels (eg, interns and fellows) in the same category for the analysis. From these data, it cannot be determined how SCH management decisions change over the course of training or during the posttraining period.

Conclusion

In summary, the presence of hypothyroid symptoms and degree of elevation of TSH were primary factors in the decision to treat SCH. Faculty physicians were more confident in the diagnosis of SCH, were more likely to consider patient preferences in the treatment decision, and tended to favor active monitoring or treatment of SCH relative to trainees in most clinical scenarios. However, the overall heterogeneity in clinical decision-making in SCH, including in situations where TSH levels are >10 mIU/L, amongst both trainees and faculty, demonstrated a notable degree of discordance from standard management principles. All clinicians would likely benefit from improved distribution and usability of clinical guidance for SCH management.

Disclosure

Dr Jiang, Dr Wolf, Dr Kaakati, Dr Oh, Dr Yip, Dr Jonklaas, Dr Laiterapong, and Dr Ettleson have nothing to disclose. Dr Bianco reports consulting fees from AbbVie, Allergan, Sention

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