ORIGINAL ARTICLE ÖZGÜN ARAŞTIRMA

Examining Thyroid Testing Practices and Relevant Costs for Children Experiencing Chronic Constipation

Kronik Kabızlığı Olan Çocuklarda Tiroid Testi İstem Sıklığı ve İlişkili Maaliyetlerin Hesaplanması

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Abstract

Introduction: The study aims to evaluate trends in thyroid testing and direct medical costs incurred by clinical visits and thyroid function tests in children with constipation.

Materials and Methods: Hospital records identified children with chronic constipation with an ICD code of K59.0. The number of follow-up visits, thyroid hormone test results, and tests performed for each patient were extracted. Patients treated before were compared to those treated after the launch of the Nationwide Neonatal Screening Program (NNSP) for congenital hypothyroidism. Medical costs were calculated based on the current exchange rate for the US dollar.

Results: 2126 follow-up visits and 1363 thyroid function tests were performed for 1128 constipated children. The total number of patients referred before and after the launch of the NNSP was 182 (16.1%) and 946 (83.9%), respectively. Of whom, 937 (%83.1) underwent thyroid testing, and the reported prevalence of hypothyroidism was %6.4 (60). Patients admitted before the launch of NNSP had a significantly higher mean age (12.57±0.89 years) compared to those admitted after (5.14±1.44) ($p<0.001$). Repeat thyroid testing for patients without hypothyroidism before was higher than after the launch of NNSP; 45.2% (59) vs. 31.9% (210), respectively ($p=0.001$). The mean cost incurred to diagnose a new patient with hypothyroidism was higher than a standard patient: 70 USD vs 53 USD respectively. The billed per-patient cost for children without hypothyroidism was higher before than after the launch of the NNSP: 46 USD vs 38 USD, respectively.

Conclusion: The NNSP implementation for congenital hypothyroidism has reduced the age of patients referred for chronic constipation and modified thyroid testing protocols for clinicians. Unnecessary thyroid testing in children with chronic constipation and dysregulation of operation in the general health insurance coverage system increases medical costs, and the NNSP for congenital hypothyroidism is connected with decreasing medical costs.

Keywords
Children, chronic constipation, hypothyroidism, medical expenditures

Anahtar kelimeler
Çocuklar, kronik kabızlık, hipotiroidizm, tıbbi maliyetler

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Öz

Giriş: Çalışmanın amacı, kronik kabızlığı olan çocuklarda klinisyenlerin tiroid testi isteme eğilimleri ve klinik ziyaretler ile tiroid fonksiyon testleri nedeniyle oluşan doğrudan tıbbi maliyetleri değerlendirmektir.

Gereç ve Yöntem: Hastane kayıtlarından K59.0 ICD koduna sahip kronik kabızlığı olan çocukları tanımlandı. Her hasta için takip ziyaretlerinin sayısı, tiroid hormonu test sonuçları ve yapılan testler çıkarıldı. Konjenital hipotiroidizm için Ulusal Yenidoğan Tarama Programı (UYTP) başlatılmasından sonra tedavi

edilen hastalarla daha önce tedavi edilen hastalar karşılaştırıldı. Tıbbi maliyetler, ABD doları için geçerli güncel döviz kuruna göre hesaplandı.

Bulgular: 1128 kabız çocuk için 2126 izlem ziyareti ve 1363 tiroid fonksiyon testi yapıldı. UYTP'nin başlatılmasından önce ve sonra kronik kabızlık nedeniyle muayene edilen toplam hasta sayısı sırasıyla 182 (%16,1) ve 946 (%83,9) idi. Bunlardan 937'si (%83,1) tiroid testinden geçti ve bildirilen hipotiroidizm prevalansı %6,4 idi (60).UYTP'nin başlatılmasından önce hastaneye yatırılan hastaların ortalama yaşı (12,57 ± 0,89 yıl), sonrasında hastaneye yatırılan hastalara (5,14±1,44) kıyasla anlamlı derecede daha yüksekti ($p < 0,001$). Hipotiroidizmi olmayan hastalarda UYTP'nin başlatılmasından önce tekrarlanan tiroid testi, %43,1 (59) ve %28,4 (210) sırasıyla daha yüksekti (p=0,001). Hipotiroidizmi olan yeni bir hastayı teşhis etmenin ortalama maliyeti, standart bir hastadan daha yüksekti: sırasıyla 70 USD ve 53 USD. Hipotiroidizmi olmayan çocuklar için faturalanan hasta başına maliyet, UYTP'nin başlatılmasından önce ve sonra daha yüksekti: sırasıyla 46 USD ve 38 USD.

Sonuç: Konjenital hipotiroidizm için başlatılan UYTP uygulaması, kronik kabızlık nedeniyle değerlendirilen hastaların ortalama yaşını düşürdü ve klinisyenler için tiroid testi isteme protokollerini değiştirdi. Kronik kabızlığı olan ve genel sağlık sigortası kapsam sisteminde operasyon düzensizliği olan çocuklarda gereksiz tiroid testi tıbbi maliyetleri artırır

Introduction

Chronic constipation is one of the most common problems that physicians encounter in pediatric outpatient clinics. It is defined as the infrequent passage of feces (≤2 per week) with associated stool retention (1,2). Constipation is the most common of all gastrointestinal diseases; studies (3,4) have estimated that %1–30% of the general population experience chronic constipation (5). It is unnecessary to perform diagnostic tests for most cases in which the patient's history and the physical examination strongly suggest functional childhood constipation. However, pediatric gastroenterology consultation is required in cases of intractable constipation when typical treatments have already been followed. Early onset symptoms, urinary incontinence, and bloody diarrhea are some of the factors that should prompt clinicians to commit to further research (6).

Thyroid hormones are essential for growth, development, and metabolism regulation. Hypothyroidism, characterized by low thyroid hormone levels, can cause chronic organic constipation in children and is categorized into congenital or acquired forms. Newborn screening enables early detection and treatment of congenital hypothyroidism, while acquired hypothyroidism emerges later with varied complaints. Pediatric neurology addresses issues like large fontanels and developmental delays, while pediatric gastroenterology focuses on infants with feeding difficulties and constipation. Endocrinology outpatient clinics assess symptoms such as declining height velocity, delayed puberty, lethargy, and constipation associated with acquired hypothyroidism (7). Thyroid tests are usually ordered for evaluating pediatric patients with chronic constipation, and therefore, data to justify routine screening for hypothyroidism is scarce. A review of all thyroid tests in a pediatric gastroenterology unit found the prevalence of hypothyroidism only %0.3 in the population of isolated constipation (8).

In most developed countries, especially those in which private insurance companies or individuals cover healthcare expenditures, cost-effectiveness is decisive in establishing disease diagnosis and treatment health policies. In a study of population-based birth cohort, Choung et al. (9) reported that health expenditures for children with constipation are four times higher than for those without, with the most significant part of this financial burden occurring due to laboratory tests. As of 2019, Türkiye healthcare expenditures represented 16.3% of its total financial output, totaling 156.9 billion TL (around 26 billion USD) (10). The state primarily covers healthcare costs, which leads to a tendency among physicians to disregard cost-effectiveness when ordering diagnostic tests. This results in no financial limitations or penalties for patients and clinicians regarding testing. Furthermore, inadequate systems for sharing test results contribute to unnecessary healthcare spending. Routine screening for rare diseases is not cost-effective for common symptoms. The ESPGHAN/NASPGHAN guidelines from 2014 state that routine testing for hypothyroidism in children with chronic constipation is not recommended. Testing should only be conducted if there are alarming symptoms, such as growth retardation, a family history, treatment failure, or recurrent constipation (6). Türkiye national neonatal screening program for congenital hypothyroidism (NNSP) started in 2006 and measures primary TSH levels (μU/mL). Consent from patients or families is not needed for screening. The NNSP may impact doctors' preferences for thyroid testing in different clinical situations.

The main aim of this study is to evaluate the frequency of thyroid testing in children with chronic constipation and current trends in clinicians' ordering preferences in Türkiye since the establishment of an NNSP for congenital hypothyroidism. Another aim is to obtain general information about the direct medical costs incurred by clinical visits and thyroid testing in pediatric gastroenterology units.

Materials and Methods

This study investigated all children with chronic constipation who visited the Pediatric Gastroenterology Outpatient Unit of University of Health Science Türkiye, Gülhane Training and Research Hospital. Children diagnosed with chronic constipation with an ICD code of K59.0 between September 2016 and September 2020 were identified from the hospital record system and reviewed retrospectively.

Chronic constipated children are referred to the pediatric gastroenterology department in the presence of any accompanying and/or alarming symptoms by the attending pediatrician. Therefore, we did not aim to obtain a detailed medical history.

Individuals who did not meet the criteria for chronic constipation according to Rome 4 and who were previously known to have hypothyroidism or any other organic cause for constipation (such as anorectal malformations, Hirschsprung disease, and cerebral palsy) were excluded from the study.

Information about the demographic details of the patients, the number of follow-up visits for constipation in the pediatric gastroenterology unit, thyroid hormone test results, and the number of tests performed for each patient were extracted from the hospital's electronic database and patients' medical files. Because this is a retrospective analysis, full data on the indication for repeat thyroid testing could not be collected, and the decision to test for hypothyroidism was at the attending physician's discretion. All information was recorded on a data sheet.

To better understand whether the NNSP influences doctors' clinical decisions, the patients were divided into two groups: those treated before and those treated after the launch of the NNSP. This study also investigated the number of patients diagnosed with hypothyroidism according to both TSH and T4 levels results, together with the frequency and number of measurements. Hypothyroidism is defined by the following laboratory values: free T4<0.8 ng/μL (for all ages) or TSH>5.5 mIU/L (older than 30 days of age).

To determine the laboratory costs, the unit prices of TSH and T4 level tests were derived from the relevant unit of the hospital and calculated based on the current exchange rate for the Turkish lira (TL) and the US dollar (USD). According to the general health insurance reimbursement regulations in Türkiye, the package price of a patient physical examination, all laboratory tests, radiologic imaging, and consultations account for 50 TL (7.14 USD). All follow-up visits included in the study were performed at the same pediatric gastroenterology unit and incorporated into the cost calculation. Total billed costs also included other costs for radiologic imaging and other tests (e.g., celiac screening). When determining the cost calculation, we assumed an average daily parental income of 150 TL (21 USD), based on the typical daily wage earned in Türkiye. One patient's cost per visit corresponds to 200 TL (29 USD).

Statistical Analysis

Statistical analyses were performed using SPSS version 21.0 (Chicago, IL, USA). The Kolmogorov-Smirnov test was performed to derive the distribution of the continuous variables and analyzed with the Student's t-test. The categorical data between groups were analyzed using the chi-squared test and presented as a total count and a percentage value. The statistical significance was defined as $p<0.05$.

Results

5,641 patients were referred to the pediatric gastroenterology unit in the study period, and the total number of patients examined for chronic constipation was 1,128 [with a mean age of 7.8 years; 617 (54.7%) were female], while 2,126 follow-up visits (ranging from one to eight per patient) were performed. A total of 45.1% (n=509) of patients were examined once, 32.6% (n=368) twice, and 22.3 % (251) were examined three or more times. Figure 1 demonstrates the flow diagram of the participating patients in the study.

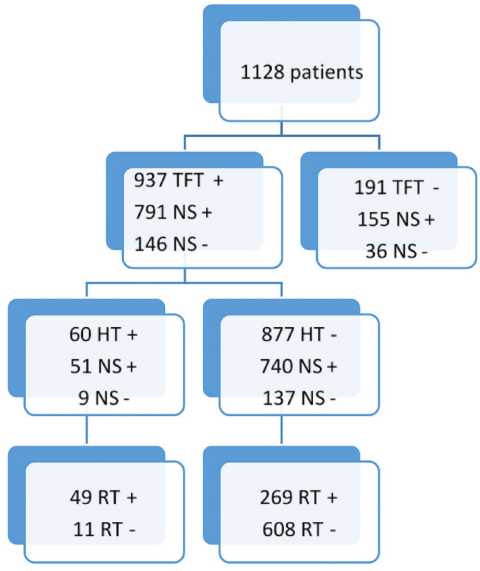

Figure 1. The flow diagram of the participating patients
TFT+ Patients who underwent thyroid testing
TFT- Patients who did not undergo thyroid testing
NS+ Patients who underwent neonatal thyroid screening
NS- Patients who did not undergo neonatal thyroid screening
HT+ Patients with hypothyroidism
HT- Patients without hypothyroidism
RT+ Patients who underwent repeat thyroid testing
RT- Patients who did not undergo repeat thyroid testing

The total number of patients who were screened for hypothyroidism was 937 (83.1%) (with a mean age of 7.7 years; 54.7% [(n=513) were female], of whom 54.9% (n=619) were screened once, 18.6% (n=210) twice, and 9.6% (n=108) were screened three times.

Of these 937 patients, 93.6% (n=877) received routine thyroid function test (TFT) results, and 5.3% (n=60) were diagnosed with hypothyroidism. The mean age of patients who were diagnosed with hypothyroidism was 7.64 years, ranging from one to 17, and 58.3% [n=35] were female. The percentage of patients diagnosed with hypothyroidism before and after the NNSP was 6.2% (n=9) and 6.4% (n=51), respectively (p= 0.898). Two infants diagnosed with hypothyroidism were referred before the launch of NNSP with feeding difficulties. The 8-month-old infants had dysmorphic features suggesting Down Syndrome and the 1-year-old infant had a coarse face with large fontanels and tongue. These two infants are assumed to have congenital hypothyroidism. And L-thyroxin treatment was initiated. The remaining 7 patients diagnosed with hypothyroidism who were referred before the launch of NNSP did not have any accompanying symptoms. 51 patients with hypothyroidism were admitted after the launch of the NNSP. 16 patients had constipation accompanied by declining height velocity. 5 patients were both overweight and stunted, and one patient had obesity and slow growth. 29 patients had constipation alone. All the patients with hypothyroidism were referred to the pediatric endocrinology department, and none of them were diagnosed with congenital hypothyroidism. Of them, 17 patients had a noticeable goiter and were diagnosed with autoimmune thyroiditis. Two patients were accompanied by celiac disease, and one patient was on the course of phenobarbital therapy because of a new emerging epilepsy.

The total number of TFTs performed to aid in diagnosing patients with hypothyroidism was 1.363. The percentage of repeat screening of TFTs was significantly higher in patients with hypothyroidism than for patients without, at 81.7% (n=49) and 30.7% (n=269), respectively (p=0.001). Repeat testing decisions for hypothyroidism were at the discretion of the attending physician, and data on the indication for repeat thyroid testing could not be collected. Repeated tests performed at least four weeks apart.

The total number of patients referred before the launch of the NNSP was 182 (16.1%), with the remaining 946 (83.9%) referred after NNSP. The mean age of patients admitted before the launch of NNSP was significantly higher than that of patients after the launch of NNSP: 12.57±0.89 years and 5.14±1.44, respectively (p<0.001). The percentage of patients who have undergone thyroid testing before and after the launch of the NNSP was similar, at 80.2% (n=146) and 84.4% (n=791), respectively (p=0.263). The percentage of repeat thyroid testing for patients who were not hypothyroid was significantly higher before the NNSP than after the launch of the program, at 45.2% (n=59) and 31.9% (n=210), respectively (p=0.001). Table 1 demonstrates the demographic and clinical characteristics of the patients in the study.

Costs

The total billed cost for children with chronic constipation was 59,551 USD, and the per-patient cost to evaluate one patient with chronic constipation was 53 USD. The total billed cost for children with hypothyroidism was 4,229 USD, and the per-patient cost incurred to diagnose a patient with hypothyroidism was 70 USD. The total billed cost for all thyroid tests performed for children with and without hypothyroidism accounted for 3,782 USD and 34,398 USD, respectively. The total billed cost for all thyroid tests before and after the launch of the NNSP for children without hypothyroidism accounted for 6,246 USD and 28,151 USD, respectively. Table 2 demonstrates the thyroid hormone test numbers for screening hypothyroidism and associated costs in chronically constipated children.

The per-patient cost for thyroid tests before and after the launch of the NNSP for patients without hypothyroidism accounted for 46 USD and 38 USD, respectively.

Table 1. Demographic an clinical characteristics of the patients in the study

	Before NNSP n=182	**After NNSP n= 946**
*Age, years ± SD	12.57±0.89	5.14±1.44
*Male gender, %	35.7	47.1
Follow-up visits, n	1.9	1.8
Thyroid screening, %	80.2	83.6
*Repeat thyroid screening, %	45.2	31.9
Hypothyroid patients, n	9	51
Hypothyroidism ratio, %	6.2	6.4

*p<0.0, NNSP: Nationwide neonatal screening for congenital hypothyroidism

Table 2. The thyroid hormone test numbers for screening hypothyroidism and associated costs in chronically constipated children

Thyroid screening number	**1**		**2**		**3**		
Patients underwent thyroid screening	Number (n)	Cost TL/(Dollar)	Number (n)	Cost (TL) TL/ (Dollar)	Number (n)	Cost TL/(Dollar)	Total cost TL/(Dollar)
Cases with hypothyroidism (n=60)	11	308	23	1.289	26	2.185	3.782
Cases without hypothyroidism (n=877)	608	17.031	187	10.476	82	6.891	34.398
Pre-NNSP (n=137)	78	2.184	32	1.793	27	2.269	6.246
Post-NNSP (n=740)	530	14.846	155	8.683	55	4.622	28.151

Discussion

Our study indicated an additional medical visit burden because of chronically constipated children in our pediatric gastroenterology unit; we found 2126 follow-up visits for 1128 chronically constipated children in a four-year period, and approximately one-fifth of the patients examined in our pediatric gastroenterology unit suffered from chronic constipation. Chronic constipation is a prevalent childhood condition, yet there is limited awareness about it among the general public. The lengthy healing process involves non-medical (dietary and lifestyle changes, stress management) and medical treatments (6,11-12). The treatment period for chronic diseases can strain the trust between parents and physicians, especially if parents perceive setbacks as treatment failures. This often leads to seeking second opinions. Chronic conditions typically require frequent outpatient visits and diagnostic evaluations to monitor disease progression. Additionally, complications may result in increased hospital admissions for intensive treatment and care. Liem et al. (13) conducted a nationally representative household survey in the United States. They observed an increased use of health services and three times higher expenditures per year among constipated children. At the same time, in their population-based birth cohort study, Choung et al. (9) found an increased utilization of healthcare system resources from childhood to early adulthood.

In the present study, we found a higher rate of thyroid screening, exceeding %80 in children with chronic constipation. Once hypothyroidism is thought to be frequent in children with chronic constipation, thyroid testing is a common clinical practice among pediatricians as a routine part of the diagnostic evaluation (8,14). In their retrospective chart review of patients admitted to the pediatric gastroenterology department, Bennet and Heuckeroth (8) found thyroid testing to be performed on 30% of children with constipation. Of those for whom thyroid testing was performed, the ratio of hypothyroidism between pure constipated children was 0.2%. Therefore, the likelihood of hypothyroidism increased to 2.5% with the addition of both constipated and slow-growing patients (8). In a recent retrospective cohort study, Chogle and Saps (15) studied 7,472 children with constipation, of whom 2,332 were screened for hypothyroidism. Constipation was the presenting finding for only two of the children who were diagnosed with hypothyroidism (0.08%); the remaining 14 had growth retardation, abdominal pain, vomiting, or a combination of these symptoms. Similarly, Liem et al. (13) reported a low prevalence of thyroid disorder (1.2%) among subjects with constipation. In the present study, however, the prevalence of hypothyroidism was found to be around 6% among children undergoing thyroid screening; this is a higher percentage of hypothyroidism in children with chronic constipation than observed by Bennet and Heuckeroth (8), Chogle and Saps (15), and Liem et al. (13). Our findings may be due to the high prevalence of hypothyroidism in Turkish society, reflecting ethnic, autoimmune, and other factors such as iodine intake, all of which can influence the occurrence of the disease (16,17). In a study from Türkiye, Uzun et al. (18) reported the prevalence of hypothyroidism was %10.4 and %18.9, respectively, in children aged 6-12 and 13-19 years recently. The higher percentage of hypothyroidism in children with chronic constipation in our population may also be associated with dysregulation of the patient referral system in our country; according to the national health insurance coverage system, there is no obstacle against the patients to examine in the tertiary care directly. Thus, some patients bypass the first steps before the pediatric gastroenterology unit and have the initial examination in the tertiary step,

contributing to an increased amount of hypothyroid patients without being filtered by primary and secondary care. With noting the range of different results associated with this problem, ESPGHAN recommends clinicians investigate a possible diagnosis of hypothyroidism in children with chronic constipation only when symptoms are alarming (6); in other words, routine screening is not recommended because it is not deemed cost-effective (13). We agree with the ESPHAGAN guidelines, which recommend not to test all chronically constipated children for hypothyroidism; thus, the high prevalence rate we observed indicates that clinical staff should be careful when evaluating cases of intractable constipation. Therefore, we recommend physicians in pediatric gastroenterology units consider performing thyroid tests in the presence of alarming symptoms in chronically constipated children. The age distribution of the children involved in the study demonstrated considerable variation, highlighting the effectiveness of the screening program for congenital hypothyroidism. However, we found similar rates of hypothyroidism both before and after the launch of the NNSP. This finding aligns with our expectations. Congenital hypothyroidism typically presents various symptoms that can be observed early in life, such as lethargy, feeding difficulties, hypotonia, and developmental delays; therefore, isolated cases of constipation are rare (8,14,19). It is reasonable to suggest that other clinicians would have recognized the signs of thyroid hypofunction and initiated treatment accordingly. As a result, we believe that patients with congenital hypothyroidism who exhibit constipation as their only symptom are seldom assessed in pediatric gastroenterology. Furthermore, we noted an increase in the repeat testing ratios before the program's implementation (45.2% compared to 31.9%, p=0.001). This phenomenon may be directly linked to the subtle symptomatology associated with hypothyroidism and the tendency of clinicians to avoid the risk of overlooking mild cases in the absence of a national neonatal thyroid screening initiative.

We observed unnecessarily repeated thyroid screening in about one-third of the patients without hypothyroidism, which indicates that repeating thyroid hormone tests to rule out hypothyroidism is also a widespread clinical practice among physicians in our country. The health care system's drawbacks in notification processes and lack of a test-sharing network contribute to unnecessary thyroid tests. The unrestricted ability of physicians to request additional analyses also plays a role. Implementing automated retrieval of test results and establishing guidelines for outpatient visits could help reduce unnecessary healthcare expenditures. Additionally, creating a national laboratory test-sharing database and ensuring clinicians adhere to guidelines when ordering tests are recommended solutions. However, one survey of pediatricians in Saudi Arabia found that only 60% of clinicians knew the Rome criteria for diagnosing functional constipation (20).

According to the national health insurance coverage system, patients in Türkiye have the right to change their clinician arbitrarily regardless of the treatment period; this negatively affects the country's healthcare system and is a financial drain on the economy as a whole. Our study indicated an additional financial burden related to medical visits in our pediatric gastroenterology unit for chronic constipation; the billed charge of an examination is 29 USD, which increases the economic burden of the diagnosis process to 61.8%. Cost-effectiveness analyses indicate that laboratory tests are one of the most important parts of the billed financial expenses for chronic constipation (9,15). The text highlights that diagnosing chronic constipation in children often requires additional tests, impacting healthcare budgets. There has been an increase in pediatric cases presenting to emergency departments, sometimes needing inpatient care, which escalates medical costs. Research shows that pediatric constipation leads to significant annual inpatient expenses worldwide (21,22). Recent studies examining bowel function through the utilization of more comprehensive and validated questionnaires have the potential to diminish the frequency of thyroid testing conducted by clinicians (23).

Although it is difficult to precisely calculate all direct and indirect medical costs that arise in the process of diagnosis among children with chronic constipation, this study has obtained general information about the direct medical costs that occur due to clinician visits and thyroid testing in Türkiye. We have considered the number of visits because it has revealed the exact burden of clinical visits in outpatient settings and the magnitude of medical costs associated with malpractices in the current healthcare coverage system. According to the general health insurance reimbursement regulations in Türkiye, the package price of a patient physical examination, consultations with other departments, and thyroid hormone test account for 7.14 USD. FT4 and TSH were measured in every patient, and measuring TSH alone would not have affected cost. The total costs for the examination and laboratory testing of children with chronic constipation account for approximately 60,000 USD, while the total cost for 1,363 thyroid hormone tests is approximately 38,000 USD. Sixty of the screened children were found to have hypothyroidism, while 877 children's tests ruled out such

a diagnosis. The financial cost of finding a single case of unrecognized hypothyroidism is higher than that of a normally constipated child (70 vs. 53 USD). Furthermore, the total billed costs for a thyroid evaluation of euthyroid children were nine times higher than for children with hypothyroidism (34,398 vs. 3,782 USD). Overall, the cost of screening per patient decreased following the implementation of the NNSP for patients without hypothyroidism (46 USD vs. 38 USD). This could also be directly related to higher repeat thyroid testing ratios before the program's implementation, demonstrating another benefit of the NNSP (45.2% vs 31.9%, p=0.001).

We performed a chart review of children who visited the pediatric gastroenterology unit between 2016 and 2020.

Study Limitations

However, we wanted to study this period because the hospitals' automated information retrieval system was renewed at the beginning of 2016, and the accessibility to patient data has increased beyond this time. In this retrospective study, all of the included patients were treated by a pediatric gastroenterologist, and it is limited by the fact that screening costs associated with the referring pediatrician, treatment, and indirect costs related to transportation were not included in the above calculations.

Conclusion

Implementing the NNSP for congenital hypothyroidism has reduced the age of patients referred for chronic constipation in outpatient clinics, modified the thyroid testing protocols employed by clinicians, and decreased medical costs. Unreasonable practices in the health insurance system can increase costs for diagnosing and treating chronic diseases like constipation. To avoid unnecessary expenses, establishing a shared laboratory results network for physicians could help physicians review patients' previous tests. Additionally, effective in-service training strategies could optimize the use of test results and reduce redundant testing.

Ethics

Ethics Committee Approval: The study was approved by the Gülhane Scientific Research Ethics Committee date: 04.09.2020, approval number: 2020/356).

Footnotes

Conflict of Interest: No conflict of interest was declared by the authors.

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