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Cost of Illness Analysis: Hidradenitis Suppurativa in Türkiye

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Abstract

Objective: Hidradenitis Suppurativa (HS), also known as Acne Inversa, is a chronic, inflammatory, recurring, debilitating skin disease of the hair follicles. It is most commonly present in the axillae, inguinal and anogenital regions. There are few studies available about the economic burden of HS on patients from different countries and we feel the need to develop such a project in the context of HS disease in Turkey. Therefore, the aim of this study is to estimate the yearly cost of HS disease in Turkey from the payer's perspective.

Materials and Methods: This is a prevalence-based CoI study with a focus on direct health care costs of HS from the perspective of the payer. A multipoint data collection procedure has been performed based on the literature search for HS epidemiological data, treatment choices, and direct health care costs to develop the analysis and the structure of the CoI of HS. The disease itself and treatment options have been reviewed. Assumptions and calculations were done according to the literature.

Results: The total number of Turkish people with HS has been estimated as 80.811 according to the 0.10 % prevalence rate of Garg and his colleagues' prevalence study. The 12 months costs were estimated as 21.067.174 TRY for patients on Hurley stage I, for the year 2018. We estimated the total direct cost attributable to HS as 741.615.190 TRY and revealed that the average one-year direct cost per patient was 9.177 TRY.

Conclusion: We found that the cost per patient seems similar but the proportions of the costs are different than the other published HS CoI studies from various parts of the world even though the methods differ greatly. HS is a disease which is attributed as 'rare' and 'unknown' but, surprisingly, it takes an important place in the national healthcare budget as treatment costs.

Keywords: Cost of illness, Hidradenitis Suppurativa, Acne Inversa, pharmacoeconomics, payer, Türkiye

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INTRODUCTION

Hidradenitis Suppurativa (HS) is a chronic, inflammatory, recurring, debilitating skin disease of the hair follicles that usually presents after puberty with painful, deep-seated, inflamed lesions in the apocrine gland-bearing areas of the body, most commonly the axillae, inguinal and anogenital regions and also known as Acne Inversa (Dessau definition, 1st International Conference on Hidradenitis Suppurativa/Acne Inversa, March 30–April 1, 2006, Dessau, Germany). (1) HS has an enormous burden, on patients and it is highly correlated with concomitant diseases including but not limited to: reduced quality of life, depression, stigmatization, decrease in physical activity, sexual deficiency, and several risk factors associated with cardiovascular diseases. (2)

Patients with HS deal with serious misdiagnosis issues because of the low disease awareness among health care professionals and patients. Saunte and colleagues showed that diagnostic delay for HS patients is 7.2 years from the onset of the first symptoms. (3) There is no room for biopsies and there are no validator laboratory assessments in the clinical diagnosis of HS. Despite the lack of established diagnosis criteria, diagnosis includes recurrence of lesions, chronicity, lack of clearance from antibiotics, sinus appearance and scarring, dermal contracture, multifocal lesion distribution, the existence of a variety of comedones, nodules, papules, soreness of lesions, and suppuration. (4) The primary diagnostic criteria of HS depend on the history of the patient and the clinical presentation of the disease. Symptoms include but are not limited to: involvement of axilla, genitofemoral area, perineum, gluteal area and infra-mammary area of women, the appearance of nodules (inflamed or non-inflamed), sinus tracts (inflamed or non-inflamed), abscesses, and scar formation (atrophic, mesh-like, red, hypertrophic, or linear). (5)

HS has been linked to several different adjuvants and secondary diseases, including obesity, metabolic problems, inflammatory bowel diseases (IBD) such as Crohn's disease (CD) and ulcerative colitis (UC), spondyloarthropathy, follicular occlusion syndrome, and other hyperergic diseases. (6) IBD, especially CD, is the most reported associated disease in patients with HS. Principi and his colleagues showed in their recent pooled data analyses that the prevalence of HS in IBD patients was 12.8%. 17.3% of the patients with CD and 8.5% of the patients with UC had HS as a comorbid disease. (7)

Spondylarthritis (SpA) is also linked to HS as a frequent comorbid disease. Schneider-Burrus et al showed that back pain and SpA are very common among patients with moderate/severe HS and more than 70% of HS patients were suffering from back pain. (8)

Over the last years, HS became one of the hot topic research areas and intense research are conducted to develop therapeutical strategies. (9) Although it was reported to be a rare disease, there are inconsistent prevalence data. Reported prevalence is changing from 0.053% to 4.1% depending on the methodology of the study. (10)- (11) It is good news that the misdiagnosis rate of HS was started to decline over the last decade. But revealing pharmacological characteristics and describing the HS burden on both patients and the governments became a major problem to be solved. (12)

Due to the few studies regarding the economic burden of HS on patients being conducted up to now in the US, some of the countries of Europe and Israel (13)- (14), it is inevitable to prepare such a project for Turkey. To the best of our knowledge, there has not been any HS CoI study conducted for Turkey to this study. Therefore, the aim of this study is to estimate the yearly cost of HS disease in Turkey from the perspective of the payer for the year 2018.

MATERIALS AND METHODS

This study is a prevalence-based CoI study in focus on direct health care costs from the view of the payer - the Ministry of Health. A multipoint data collection procedure has been implemented based on the literature search for HS epidemiological data, treatment choices, and direct health care costs for the structure of the CoI analysis of HS.

A literature search on studies published in English on HS was performed in PubMed with the keywords of "Hidradenitis Suppurativa", "Acne Inversa" and "Verneuil Disease" from 1949 to June 2018. All of the titles of the articles and abstracts retrieved from the database using these keywords have been systematically reviewed and analyzed. The disease itself and treatment options have been reviewed comprehensively.

Classification and Staging

Many different models have been developed to classify and stage HS and to assess the treatment success, such as qualitative models; Hurley Staging System and Refined Hurley Staging System. And there are also quantitative models; the Sartorius system, the modified Sartorius systems, the Hidradenitis Suppurativa Physician's Global Assessment (HS-PGA), and the Hidradenitis Suppurativa Clinical Response (HiSCR). Among these classification and staging tools, the most widely used scale to assess disease severity is the Hurley Staging system and HS-PGA. (2)

Hurley Staging

Hurley reported the Hurley Staging System, as a novel classification model to define HS in 1989. It classifies the disease as three different levels of severity (Table 1). Hurley staging is proposed as a tool to facilitate rational treatment decision-making for the surgical approach in a certain body location. (23)

The Hurley staging model was extensively used due to its suppleness and rapidness. However, it has some limits such as insufficient qualitativeness and its unvarying nature. Neither count of affected anatomical locations nor the count of lesions at each location was described by this model. Besides, it considers scars and fistulas as fixed or invariable characteristics which makes this tool ineffective for assessing the response of the therapy. (2)

Table 1. The definition of Hurley Staging.

Hurley Stage	Definition
I	Individual primary lesions and/or cysts without fistulae or scarring
II	Individual primary lesions and/or cysts with the presence of fistulae and scarring
III	Confluent primary and secondary lesions at the involved surface(s) with fistulae and scars

Prevalence Estimation

The prevalence of HS was reported at variance over the year. Studies reports that the prevalence is starting from 0.053% to 4.1%. It should be noted that there are many differences in the research methodologies and populations studied in. (10)- (11) Summary of prevalence studies has been sown in Table 2.

Table 2. Summary of HS prevalence studies.

Country / Reference	Number of Samples	Prevalence Estimation
Denmark/ Jemec, 1988 (16)	70	4 %
Denmark/ Jemec, 1996 (17)	599	4.1 %
France/ Revuz, 2008 (18)	10,000	1 %
United States/ Cosmatos, 2013 (19)	7,927	0.053 %
United States/ Sung, 2013 (20)	429,329	0.11 %
Denmark/ Vinding, 2014 (21)	16,404	2.1 %
United States/ Shahi, 2014 (10)	144,000	0.13 %
United States/ Garg, 2017 (11)	48 Million	0.10 %

There is no prevalence data available for Turkey. Several prevalence studies in different scopes (population-based vs. hospital), different periods (from 1988 to 2018) different diagnosis methodologies (self-reported, medically assessed, diagnosis of treatments codes) have been reviewed to estimate the prevalence for Turkey. The review showed an important variance in estimates and incertitude concerning the actual frequency of HS. According to this variety, the study with the highest number of patients with a prevalence rate of 0.10 % has been chosen for the analysis. (11) Garg and colleagues analyzed 48 million unique patients across all United States regions by using electronic health record data. Results showed 47,690 HS patients and overall HS prevalence in the United States was 0.10%. (11) When looking at the clinical characteristics of the study, HS prevalence among the white race was also determined as 0.10 % which has been assessed as similar to characteristics of Turkish people.
Turkish population information has been derived from the Turkish Statistical Institute as of Feb 2018 and used for the analysis. (26) Hurley I, Hurley II, and Hurley III variance has been calculated according to the study of Canoui-Poitrine F. et al which assessed the clinical characteristics of 302 French patients with HS. (15)

Determination of Treatment Approach

There have been several approaches to set a standard of care for the treatment of HS even though there is no widely accepted guideline available. In 2015, the European S1 guideline has been published by Zouboulis C. et al. (5) Guideline consists of a comprehensive review of the disease and the treatment options by evaluating clinical study results. The European S1 guideline is the most accepted and diverse guideline available for HS.
Italian Society of Dermatology and Venereology published a guideline for the use of a-TNFs for HS treatment in 2015 after the European S1 guideline. (24) It is mostly focused on a-TNF agents and refers to the European S1 Guideline widely.

At the beginning of 2016, the evidence-based approach has been published based on European guidelines. (25) It promotes a holistic evidence-based approach that implemented the Level of Evidence and Strength of Rec-

ommendation for the treatment of HS due to the need for evidence-based treatment guidelines. It is more like a complementary element of the European S1 guideline. Since there is no established treatment algorithm for HS, treatment methods derived from both the European S1 Guideline (5) and the Evidence-based Approach to the Treatment of HS (25) are adapted to the Turkish healthcare system within the frame of available treatment options. The costs of hospitalizations, physician office visits (physical examinations), medical and surgical treatments, and medical procedures were estimated from the literature and analysis of publicly available health databases. Costs of medical procedures were derived from the updated Social Security Institution Medical Enforcement Declaration and Republic of Turkey Social Security Institution reimbursement rates and wholesale drug costs for the year 2018. The prices of the available medical treatment options have been derived from the RxMediaPharma program.

RESULTS

Prevalence Estimation

The population of Turkey as of Feb 2018 has been announced as 80 million 810 thousand and 525 people. (26) The total number of Turkish people with HS has been estimated as 80.811 (+/- 4.041) with a 95% confidence interval (CI) according to the 0.10 % Garg and his colleagues' study. (11) The estimated patient number with HS has been shown in Table 3.

Among the patients with HS disease, Hurley classification estimation has been done and shown in Table 4. (15) According to that estimation which was calculated with the 95 % CI, the majority of the patients are in the group of Hurley stage I. The number of patients with Hurley stage I, II and III are 54.951 (+/- 2.748), 22.627 (+/- 1.131) and 3.232 (+/- 162), respectively.

Application of Treatment Approach

Tuberculosis examination has to be done for moderate and severe HS patients who are planning to have the treatment with biological agents before the initiation of the biological treatment according to the Medical Enforcement Declaration. (27) The cost of the tuberculosis examination tests is calculated as 128 TRY per patient.

The cost of doctor's office visits and hospitalization have been identified according to Medical Enforcement Declaration as both university hospitals and training hospitals. The mean price has been calculated accordingly (Table 10). Primary healthcare services have been excluded due to these healthcare services mostly serve as referral steps to the university or training hospitals and they have not taken any role in the management of the disease. Mean prices have been calculated as dermatology visits, general or plastic surgery visits, and hospitalization (standard bad tariff) 37 TRY, 50 TRY and 30 TRY respectively.

Table 3. Estimated number of patients with HS in Turkey.

Turkey Population	Prevalence (%)	Estimated Number of Patients with HS (with 95% CI)
80,810,525	0.10	80,811 (± 4041)

Table 4. Patient distribution according to Hurley staging.

Hurley Stage	Percentage (%)*	Estimated Patient Number (with 95% CI)
I	68	54,951 (±2748)
II	28	22,627 (± 1131)
III	4	3232 (±162)

*Canoui-Poitrine F, et al. (15)

Since there is no established treatment algorithm for HS as expressed in the materials and methods section, treatment methods are derived from current HS treatment guidelines and adapted to the Turkish healthcare system within the frame of available treatment options. 1st line treatment options have been used for cost calculation only. 2nd, 3rd line, and experimental treatment options have not been taken into consideration. (25) For each active substance that is present in the Turkish market, available pharmaceutical preparations have been identified from RxMediaPharma Program and the cost of unit dosage has been calculated. In this way, the mean cost of the unit dosage has been calculated for each active substance. Treatment durations have been derived from the guideline according to the unit dosage of the pharmaceutical preparations and calculated accordingly. Available 1st line treatment options and unit dosage costs have been shown in Table 5.

Medical treatment of patients with HS on Hurley stage I consists of topical clindamycin 1%, oral tetracycline 500 mg, and basic excision of the HS lesions according to the evidence-based approach treatment algorithm. (25) The recommended treatment duration of topical clindamy-

Table 5. Medical treatment options and cost of unit dosages.

Drugs	Minimum Price (TRY)	Maximum Price (TRY)	Unit Dosage Price (TRY)
Antibiotics			
Clindamycin	8.31	9.14	0.0035
Rifampicin	4.37	14.88	0.0013
Doxycycline	5.50	6.05	0.0041
Tetracycline	3.61	5.57	0.0007
Topical clindamycin	9.53	9.53	0.3177
Anti-TNFs			
Adalimumab	1186.34	1186.34	14.82

Table 6. Hurley I medical & surgical treatments and costs.

	Duration	Dosage	Unit Cost (TRY)	Total Cost (TRY)
Medical Treatment				
Topical clindamycin 1%	3 months	twice a day	0.3177 /mL	57.18
Tetracycline 500 mg	4 months	once a day	0.0007 /mg	42
Surgical Treatment				
Excision	1	NA	207.70 /session	207.70
TOTAL				**306.88**

cin is 3 months and for oral tetracycline, it is 4 months. Cost calculation has been done according to treatment duration recommendations. Surgical treatment has been calculated as 1 time in the treatment frame. The total cost has been calculated as 306 TRY for a patient on the Hurley stage I (Table 6).

With the same approach, medical and surgical treatment options have been calculated for HS patients on Hurley stage II. Medical treatment is included both topical clindamycin 1 %, oral tetracycline 500 mg, and also a combination of oral rifampicin-clindamycin 600 mg and adalimumab. (25) In addition to medical treatment, surgical treatment is recommended in a wide range if needed which are excision of the lesions, deroofing, CO2 laser excision, and primary and secondary wound closures with flap, or grafting techniques. The recommended treatment duration and cost calculation have been shown in Table 7. The total cost for a patient on the stage of Hurley II was calculated as 27.631 TRY.

For Hurley stage III patients, treatment options are much like patients on Hurley stage II except for the usage of topical clindamycin 1 %, and oral tetracycline 500 mg which these treatment options are for milder cases. (25) Surgical interventions remain the same with the Hurley II treatment scheme. Cost calculation has been done according to recommended treatment duration and again,

Table 7. Hurley II medical & surgical treatments and costs.

	Duration	Dosage	Unit Cost (TRY)	Total Cost (TRY)
Medical Treatment				
Topical clindamycin 1%	3 months	twice a day	0.3177 /ml	57.18
Tetracycline 500 mg	4 months	once a day	0.0007 /mg	42
Rifampicin 300 mg	10 weeks	twice a day	0.0013 /mg	201.60
Clindamycin 300 mg			0.0035 /mg	
Adalimumab	Continual*	160 mg at week 0, 80 mg at week 2, 40 mg weekly starting from week 4	14.82 /mg	24,897.60
Surgical Treatment				
Excision	1	NA	207.70 /session	207.70
Deroofing	1	NA	400 /session	400
CO2 laser excision	1	NA	550 /session	550
Primary wound closure	1	NA	38 /session	38
Secondary wound closure with graft	1	NA	400 /session	400
Secondary wound closure with flap	1	NA	837.20 /session	837.20
TOTAL				**27,631.28**

*According to the PIONEER clinical trial, 68% of the patients were able to apply the proposed treatment regimen in full, and in 32% of cases, the treatment was stopped at the 12th week. So the average annual dose of adalimumab has been calculated as 21 boxes with that assumption. (28)

surgical treatment has been calculated at 1 time. As a result, it appears similar to the result of Hurley stage II, the calculated cost is 27.532 TRY for a patient on Hurley stage III. (Table 8)

If the costs are grouped as medical treatment, surgical treatment, procedures/tests, and physical examinations, a total frame can be shown below, in Table 15 for patients with Hurley stages I, II, and III. For a HS patient on Hurley stage I, the yearly cost is far lower than Hurley stage II and Hurley stage III patients. Direct costs of patients according to Hurley classification are 383 TRY, 27.876 TRY, and 27.777 TRY, respectively for one patient for the year 2018. The calculation has been shown in Table 9.

As a result, the total national cost of HS to the Ministry of Health was estimated as 741.615.190 TRY (+/- 37.080.760 TRY) for the year 2018. Details of the cost calculation have been shown in Table 10. Costs have been shown with 95% CI at parenthetical in each section. It consists of direct medical costs such as medical therapy, surgical treatment, procedures, tests, and doctor's office visits (physical examinations).

The 12 months costs were estimated as 21.067.174 TRY (+/- 1.053.358 TRY) for patients on Hurley stage I, 630.760.088 TRY (+/- 31.538.004 TRY) for Hurley stage II and 89.787.927 TRY (+/- 4.489.296 TRY) for Hurley stage III for the year 2018. The largest part of the costs is attributed to medical treatment expenditures and are estimated as 654.546.051 TRY (+/- 32.727.302 TRY).

Table 8. Hurley III medical & surgical treatments and costs.

	Duration	Dosage	Unit Cost (TRY)	Total Cost (TRY)
Medical Treatment				
Rifampicin 300 mg Clindamycin 300 mg	10 weeks	twice a day	0.0013 /mg 0.0035 /mg	201.60
Adalimumab	Continual*	160 mg at week 0, 80 mg at week 2, 40 mg weekly starting from week 4	14.82 /mg	24,897.60
Surgical Treatment				
Excision	1	NA	207.70 /session	207.70
Deroofing	1	NA	400 /session	400
CO2 laser excision	1	NA	550 /session	550
Primary wound closure	1	NA	38 /session	38
Secondary wound closure with graft	1	NA	400 /session	400
Secondary wound closure with flap	1	NA	837.20 /session	837.20
TOTAL				**27,532.10**

*According to the PIONEER clinical trial, 68% of the patients were able to apply the proposed treatment regimen in full, and in 32% of cases, the treatment was stopped at the 12th week. So the average annual dose of adalimumab has been calculated as 21 boxes with that assumption. (28)

Table 9. Cost calculation.

	Cost of Stages (TRY)			
	Hurley I	**Hurley II**	**Hurley III**	**Total**
Medical Treatment	59.18	25,198.40	25,099.20	50,356.78
Surgical Treatment	207.70	2432.90	2432.90	5073.50
Procedures & Test	0	128.70	128.70	257.40
Physical Examinations	116.50	116.50	116.50	349.50
Total cost (TRY)	383.38	27,876.50	27,777.30	

Table 10. Population adjusted cost calculation with TRY (with 95% Confidence interval).

	Hurley I	Hurley II	Hurley III	Total
Medical treatment	3,211,941.96 (±160,597.10)	563,137,972.71 (±28,256,898.64)	80,131,576.41 (±4,006,578.82)	9,298,432.47 (± 32,324,074.55)
Surgical treatment	11,272,733.12 (± 563,636.66)	54,370,847.90 (±2,718,542.40)	7,767,263.99 (±388,363.20)	3,287,095.65 (±3,650,542.25)
Procedures & test	0.00	2,876,208.69 (±143,810.43)	410,886.96 (±20,544.35)	646,481,491.09 (±164,354.78)
Physical examinations	6,322,934.08 (±316,146.70)	2,603,561.09 (±130,178.05)	371,937.30 (±18,596.86)	73,410,845.01 (±464,921.62)
Total	**20,807,609.17** (±1,040,380.46)	**622,988,590.40** (±31,149,429.52)	**88,681,664.65** (±4,434,083.23)	732,477,864.22 (±36,623,893.21)

DISCUSSION

To our knowledge, this is the first study in the context of health care utilization and cost of Illness with HS conducted for Turkey. The literature search reveals that there are less than thirty manuscripts written about HS from Turkey. The literature is mostly about case reports or series and there is no cost-related study among those. When looking at world literature, there are only a few studies that aim to find the disease-related cost. (13)- (14) Kirby and his colleagues find out in their cohort cost-identification study that the majority of the cost was the inpatient expenditures. They also compare the results with psoriasis (PsO) patients and resulted that medication costs were higher in the PsO group. The emergency department visits and inpatient care have shown as the biggest cost source in the study. (13)

Another manuscript which is a follow-through study of Kirby and his colleagues revealed almost the same results as the previous literature. Inpatient costs were the major expenditure for HS patients. The total 5-year cost for the HS patient cohort was found as 23,418,396 USD from the perspective of the payer. HS cohort was consisting of 7,901 patients and for this instance; the cost per patient could be calculated as 2.963,97 USD. (29)

Desai and Shah conducted a retrospective cohort study in England to describe the hospital resource use of patients with HS. They found out that the mean hospital resource utilization cost for a patient with HS was 2.027 GBP per patient per year. But it should be noted that the study does not include the details of medication and it is just based on outpatient, inpatient, accident, and emergency hospital attendances. (30)

Shalom and his colleagues conducted a study very recently in Israel and they compare the healthcare service utilization cost of HS patients with PsO patients and also with the general population. Community clinic visits and inpatient service utilization with drug use data have been included in the study. But biological medications were not available in Israel for the treatment of HS during the study therefore they were not included in the analysis. They found out that the burden of HS patients was greater than both PsO and the general population. There wasn't an estimate on any monetary terms in the study. (31)

The results of our analysis showed that the direct cost of patients with HS is more than that recognized in Turkey's health care system. The estimation of the total direct cost attributed to HS is 741.615.190 TRY (+/-37.080.759 TRY) and revealed that the mean one-year direct cost for one patient is 9.177 TRY (+/- 458 TRY).

Medications seem to be only the definitive important resources funded by the Turkish public health system and if we calculated the contribution margin of the medicines even by patients.

Even though the studies' methods are different, it is possible to compare the results with our study. The cost per patient seems similar between the studies but the source and the proportions of the costs were different.

This study has several limitations and they should be considered along with the results. According to current literature, there is no epidemiological data from Turkey. Accordingly, prevalence data is assumed based on the work of Garg et al. (11), and the number of existing HS patients is hypothetically calculated by the relevant data

on the population of Turkey. Likewise, the distribution of patients according to the Hurley stages was also calculated based on the study of Canoui-Poitrine et al. (15) Under or overestimation of the number of patients with HS is possible according to these calculations.

A wide variety of therapeutic options are used in the management of HS patients, as evidenced by current literature. To be able to perform an analysis on a structured system, the most ideal and optimal situation, which is based on first-line treatment options of the evidence-based treatment algorithm (25), has been considered and the calculations are made by assuming appropriate treatments are used for each Hurley stage. In reality, there might be patients that have the optimal treatments by their staging but also we know that there are patients that are not treated optimally. So it should be highlighted that the result of this analysis is the picture of an optimal situation.

For the surgical interventions, because the number and types of surgical operations that each patient need will vary, analysis is made with the minimum values and included in the result. The disease itself is unique for every patient and surgical needs will change, therefore it is not possible to reflect the real-life situation in the analysis. In addition to that, possible direct costs of HS have been discussed widely but the indirect costs are not described and not taken into account in this study. The results should be interpreted with consideration of all these limitations.

CONCLUSION

Identifying and measuring the costs of HS will let us understand the financial burden of the disease more distinctly. The resources used and the potential resources that were lost have been identified in the CoI studies. Along with the prevalence, incidence, morbidity, and mortality data, CoI studies assist to draw the frame about the effect of a disorder on the public. (32)

Determining the total CoI let us know how much society and/or payer is spending on that specific disorder and by implication the amount that would be saved if the disorder were extinguished. It may also help identify the various elements of the cost and the extent of the contribution of each sector in society. These data can help to determine research and funding priorities by highlighting areas where inefficiencies may exist and savings can be made. (33), (34)

Knowledge of the CoI can help policymakers decide which diseases need to be addressed first by health care and prevention policies. Additionally, these studies can indicate which disease cures would be valuable in reducing the burden of disease and also reducing costs. (35)
As a result, it is critical to demonstrate CoI studies to inform clinical decision-making, bring forth new policies and guidelines, and effectively allocate resources accordingly. (36)

Even though HS is a disease which attributed as ‘rare’ and ‘unknown’, it is surprising that it takes an important place in terms of treatment costs.

Here we estimated the economic burden of optimally managed HS. Intensive pharmacotherapy is required to manage symptoms, especially for the patients with Hurley II and III stages; yet, a significant proportion of patients have inadequate control with current treatment regimens according to current literature. Since there is no commonly accepted treatment guideline, physician treatment variety, patient education, and adherence to prescribed regimens remain central issues in achieving control, HS is a heterogeneous condition with variable responses to existing therapies. It is also important to take into consideration the effect of comorbidities (e.g. metabolic syndrome, obesity, etc.) on the cost of HS and outcomes.

This study has been constructed with the data available in the current literature and applied to the Turkish healthcare system. This CoI study emphasizes the value and need for longitudinal HS cohort studies and the study that evaluates how patients receive care throughout the health care system, not only of disease activity. By broadening the point of view even more widely, studies can start to take into account not only the direct costs to the whole health care system but also the indirect costs resulting from the disease's impact on the ability of the patient (and possibly caregiver person) to work, and this would address the indirect cost of the disease.

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