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Cost of Illness Analysis of Sickle cell disease in Greece

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KEY FINDINGS & CONCLUSIONS

- SCD comprises a considerable economic burden on the Greek healthcare system, with drug acquisition costs attributing most to the total direct cost.
- Total cost of managing SCD might be much higher as certain aspects of SCD related costs such as direct non-medical and indirect costs were not captured in this study.
- SCD should be recognised as a priority disease in government strategies and planning's in Greece.

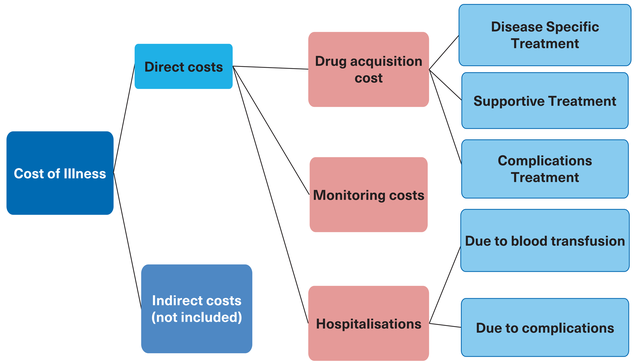
INTRODUCTION AND OBJECTIVE

- Sickle cell disease (SCD) is a group of genetically inherited illnesses marked by the presence of a point mutation in the haemoglobin (Hb) gene, the protein responsible for carrying oxygen from the lungs to body tissues. (1, 2)
- The long-term degenerative processes of SCD lead to significant health complications, which affect many systems/organs of the body. (3)
- Vaso occlusive crises (VOCs), also known as sickle cell pain crises, are the hallmark of SCD. (2, 4, 5)
- SCD is associated with a substantial economic burden, since routine and lifelong care is needed to treat the disease and its associated and often serious complications. However, there is limited evidence available on the cost of SCD in Greece.
- The aim of this analysis was to estimate the direct costs associated with SCD in Greece.

METHODS

- Cost of Illness (COI) methodology was used to estimate the economic burden of SCD on the Greek population over one-year time horizon. (**Figure 1**) (6)
- The analysis was performed from National Organisation for the Provision of Health Services (EOPYY) perspective and costs were estimated in Euros (€) with reference year 2020.
- Exclusively direct medical costs were included in this analysis since only this cost category is reimbursed by EOPYY. Resource use components were collected from six leading haematologists using the modified Delphi method.
- Apart from the base case analysis, three additional alternative scenarios were developed considering (1) increased prevalence of SCD, (2) cost of blood unit and (3) hospitalisation cost based on the UK Diagnosis Related Group (DRG) for SCD.
- SCD prevalence was derived from National Registry for Haemoglobinopathies in Greece (NRHG). (7)

Figure 1. Schematic presentation of Cost of illness study design



RESULTS

Base case results:

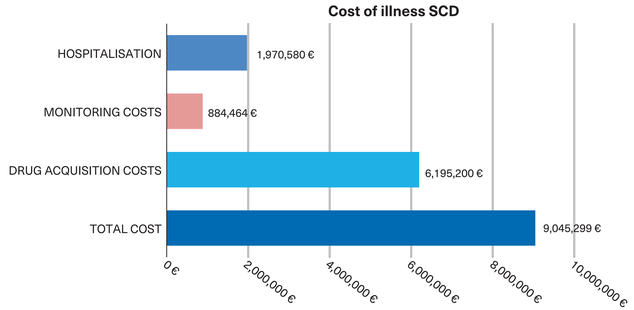
- From 2010 to 2015, a total of 1032 SCD patients with haemoglobinopathies were identified in the NRHG database with a total direct cost of €9,045,299 for a 12-month treatment period. (**Figure 2**)
- The cost of drug acquisition was the highest accounting for 68% of the total direct cost of SCD which was followed by hospitalisation 22%.
- Monitoring expenditures accounted for 10% of the overall direct annual cost. (**Figure 3**)
- Hospitalisation for management of complications was the biggest cost driver at €1,647,490 (83.6% of total hospitalisation costs).
  - This cost represents 4,039 blood transfusions (8,077 Red Blood Units) per year for SCD patients just for disease specific treatment. (8)
- Detailed annual total cost allocation for SCD patients is summarised in (**Table 1**).

RESULTS (CONTINUED)

Scenario Analysis:

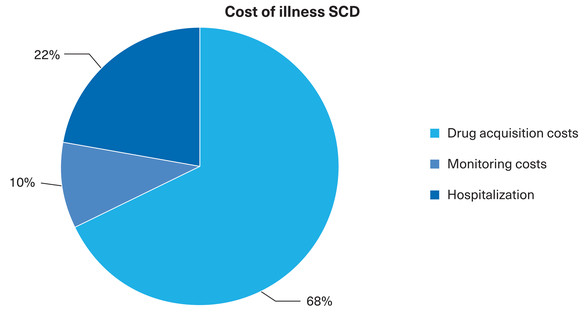
- For alternative scenario (Increased population), with a prevalence of SCD estimated at 1,400 patients based on experts' input in Greece, the key cost driver was drug acquisition cost resulting in a total direct cost for a 12-month treatment period estimated at €12,270,681.
- In the second alternative scenario (Including blood transfusions cost), the required red blood cells transfusions increased the total annual direct cost of SCD management in Greece by €13,381,800. (8)
- In the third alternative scenario (Hospitalisation costs), acquisition cost remained the major cost driver. However, the cost of hospitalization increased to (37%) of the total costs (vs 22% in the base case scenario). (9) (**Table 2**)

Figure 2. Annual total direct cost allocation for SCD patients (in €)



SCD: Sickle Cell Disease

Figure 3. Annual total cost allocation for SCD patients (in %)



SCD: Sickle Cell Disease

Table 1. Detailed annual total cost allocation for SCD patients

Cost of Illness SCD	Annual cost
Drug acquisition costs	**€6,190,255**
Hydroxyurea (Siklos, 1000mg/day, per os)	€2,736,246
Iron chelating therapy [1]	€3,062,101
Supportive care treatment [2]	€73,191
Complications Treatment [3]	€318,718
Monitoring costs	€884,464
Laboratory and Imaging tests [4]	**€744,828**
Physician visits (follow up) [5]	**€139,636**
Hospitalisation costs	**€1,970,580**
Hospitalisation for disease specific treatment administration (blood transfusion)	€323,090
Hospitalisation for complications management [6]	€1,647,490
Total	**€9,045,299**

SCD: Sickle Cell Disease
[1]Includes 50% Deferasirox, 40% Deferiprone, 10% Deferoxamine; [2]Includes folic acid, antiplatelets and analgesics; [3]Includes drugs for complications treatment (ie denosumab, Bosentan, Budesonide); [4]Includes tests for diagnosis, follow up and complications management; [5]Includes physician visits for routine follow up and complications management, [6]Includes DRGs and hospitalization for blood transfusions for complications management

Table 2. Alternative scenarios analysis

Cost of illness SCD	Annual cost
Alternative Scenario (Increased population)	
Drug acquisition costs	€8,397,633
Monitoring costs	€1,199,781
Hospitalisation	€2,673,267
Total	€12,270,681
Alternative Scenario (including blood transfusion cost)	
Drug acquisition costs	€6,190,255
Monitoring costs	€884,464
Hospitalisation	€1,970,580
Blood Transfusions Costs	€4,336,501
Total	**€13,381,800**
Alternative Scenario (Hospitalisation cost)	
Drug acquisition costs	€13,381,800
Monitoring costs	€884,464
Hospitalisation	€4,226,301
Total	**€11,301,020**

SCD: Sickle Cell Disease

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