

Citations of the studies added in the systematic review (1-184)

1. Al-Haggar M, Al-Marsafawy H, Abdel-Razek N, Al-Baz R, Mostafa AH. Acute painful crises of sickle cell disease in Egyptian children: predictors of severity for a preventive strategy. *Int J Hematol.* 2006;83(3):224-8.
2. Al-Rimawi HS, Abdul-Qader M, Jallad MF, Amarin ZO. Acute splenic sequestration in female children with sickle cell disease in the North of Jordan. *J Trop Pediatr.* 2006;52(6):416-20.
3. Mallouh AA, Qudah A. Acute splenic sequestration together with aplastic crisis caused by human parvovirus B19 in patients with sickle cell disease. *J Pediatr.* 1993;122(4):593-5.
4. el-Hazmi MA, Warsy AS. Alpha thalassaemia in Yemeni children with sickle cell disease. *J Trop Pediatr.* 1999;45(6):370-4.
5. Malek Y, Abdellaoui T, Khmamouche M, Zerrouk R, Reda K, Oubaaz A. Angioid streaks secondary to homozygous sickle cell disease. *J Fr Ophtalmol.* 2020;43(8):813-5.
6. ElAlfy MS, Ebeid FSE, Kamal TM, Eissa DS, Ismail EAR, Mohamed SH. Angiotensinogen M235T Gene Polymorphism is a Genetic Determinant of Cerebrovascular and Cardiopulmonary Morbidity in Adolescents with Sickle Cell Disease. *J Stroke Cerebrovasc Dis.* 2019;28(2):441-9.
7. el-Hazmi MA, Warsy AS. Appraisal of sickle-cell and thalassaemia genes in Saudi Arabia. *East Mediterr Health J.* 1999;5(6):1147-53.
8. el-Hazmi MA, Warsy AS. Aspects of sickle cell gene in Saudi Arabia--interaction with glucose-6-phosphate dehydrogenase deficiency. *Hum Genet.* 1984;68(4):320-3.
9. El-Ghamrawy M, Yassa ME, Tousson AMS, El-Hady MA, Mikhaeil E, Mohamed NB, et al. Association between BCL11A, HSB1L-MYB, and XmnI γ G-158 (C/T) gene polymorphism and hemoglobin F level in Egyptian sickle cell disease patients. *Ann Hematol.* 2020;99(10):2279-88.
10. Farawela HM, El-Ghamrawy M, Farhan MS, Soliman R, Yousry SM, AbdelRahman HA. Association between Duffy antigen receptor expression and disease severity in sickle cell disease patients. *Hematology.* 2016;21(8):474-9.
11. Chaouch L, Kalai M, Jbara MB, Chaabene AB, Darragi I, Chaouachi D, et al. Association between rs267196 and rs267201 of BMP6 gene and osteonecrosis among sickle cell anemia patients. *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub.* 2015;159(1):145-9.
12. Ben Sassi M, Chaouch L, Kalai M, Moumni I, Ouragini H, Darragi I, et al. Association of rs1319868, rs1567811 and rs8041224 of IGF1R gene with infection among sickle cell anemia Tunisian patients. *Acta Haematologica Polonica.* 2016;47(4):242-7.
13. El Sissy MH, Hafez AA, Moneim SEA, Eldemerdash DM. Association of the CCR5 Δ 32 Mutant Genotype with Sickle Cell Disease in Egyptian Patients. *Hemoglobin.* 2019;43(4-5):258-63.
14. Al-Absi IK, Al-Subaie AM, Ameen G, Mahdi N, Mohammad AM, Fawaz NA, et al. Association of the methylenetetrahydrofolate reductase A1298C but not the C677T single nucleotide polymorphism with sickle cell disease in Bahrain. *Hemoglobin.* 2006;30(4):449-53.
15. Adekile AD, Gupta R, Yacoub F, Sinan T, Al-Bloushi M, Haider MZ. Avascular necrosis of the hip in children with sickle cell disease and high Hb F: magnetic resonance imaging findings and influence of alpha-thalassemia trait. *Acta Haematol.* 2001;105(1):27-31.
16. Gelpi AP. Benign sickle cell disease in Saudi Arabia: survival estimate and population dynamics. *Clin Genet.* 1979;15(4):307-10.
17. Alayash AI, Bonaventura J, al-Quorain A. A benign sickle-cell disease in a Saudi subject with beta zero-thalassemia and glucose-6-phosphate dehydrogenase deficiency. *Hum Hered.* 1989;39(2):118-20.

18. Inati A, Taher A, Bou Alawi W, Koussa S, Kaspar H, Shbaklo H, et al. Beta-globin gene cluster haplotypes and HbF levels are not the only modulators of sickle cell disease in Lebanon. *Eur J Haematol.* 2003;70(2):79-83.
19. Al-Saqladi AW, Brabin BJ, Bin-Gadeem HA, Kanhai WA, Phylipsen M, Harteveld CL. Beta-globin gene cluster haplotypes in Yemeni children with sickle cell disease. *Acta Haematol.* 2010;123(3):182-5.
20. el-Hazmi MA. Beta-globin gene haplotypes in the Saudi sickle cell anaemia patients. *Hum Hered.* 1990;40(3):177-86.
21. el-Hazmi MA. Beta-globin gene polymorphism in the Saudi Arab population. *Hum Genet.* 1986;73(1):31-4.
22. Fattoum S, Guemira F, Oner C, Oner R, Li HW, Kutlar F, et al. Beta-thalassemia, HB S-beta-thalassemia and sickle cell anemia among Tunisians. *Hemoglobin.* 1991;15(1-2):11-21.
23. Samarah F, Ayeshe S, Athanasiou M, Christakis J, Vavatsi N. beta(S)-Globin gene cluster haplotypes in the West Bank of Palestine. *Hemoglobin.* 2009;33(2):143-9.
24. Alenzi FQ, AlShaya DS. Biochemical and Molecular analysis of the beta-globin gene on Saudi sickle cell anemia. *Saudi J Biol Sci.* 2019;26(7):1377-84.
25. Kaddam LA, Fdl-Elmula I, Eisawi OA, Abdelrazig HA, Elnimeiri MK, Saeed AM. Biochemical effects and safety of Gum arabic (*Acacia Senegal*) supplementation in patients with sickle cell anemia. *Blood Res.* 2019;54(1):31-7.
26. el-Hazmi MA, Warsy AS, Bahakim H. Blood proteins C and S in sickle cell disease. *Acta Haematol.* 1993;90(3):114-9.
27. Kotb MM, Tantawi WH, Elsayed AA, Damanhoury GA, Malibary HM. Brain MRI and CT findings in sickle cell disease patients from Western Saudi Arabia. *Neurosciences (Riyadh).* 2006;11(1):28-36.
28. Al Jahdhamy R, Makki H, Farrell G, Al Azzawi S. A case of compound heterozygosity for Hb S and Hb S Oman. *Br J Haematol.* 2002;116(3):504.
29. el-Hazmi MA, al-Swailem AR, Warsy AS. Case studies on haemoglobin S heterozygotes with severe clinical manifestations. *J Trop Pediatr.* 1990;36(5):223-9.
30. Afifi RA, Kamal D, Sayed RE, Ekladios SMM, Shaheen GH, Yousry SM, et al. CD209-336A/G promotor polymorphism and its clinical associations in sickle cell disease Egyptian Pediatric patients. *Hematol Oncol Stem Cell Ther.* 2018;11(2):75-81.
31. Al-Humood S, Zueriq R, Al-Faris L, Marouf R, Al-Mulla F. Circulating cell-free DNA in sickle cell disease: is it a potentially useful biomarker? *Arch Pathol Lab Med.* 2014;138(5):678-83.
32. el-Hazmi MA. Clinical and haematological diversity of sickle cell disease in Saudi children. *J Trop Pediatr.* 1992;38(3):106-12.
33. Haj Khelil A, Laradi S, Miled A, Omar Tadmouri G, Ben Chibani J, Perrin P. Clinical and molecular aspects of haemoglobinopathies in Tunisia. *Clin Chim Acta.* 2004;340(1-2):127-37.
34. Adzaku F, Addae S, Annobil S, Mohammed S. Clinical features of sickle cell disease at altitude. *Journal of Wilderness Medicine.* 1992;3(3):260-8.
35. el-Hazmi MA. Clinical manifestation and laboratory findings of sickle cell anaemia in association with alpha-thalassaemia in Saudi Arabia. *Acta Haematol.* 1985;74(3):155-60.
36. Wali Y, Beshlawi I, Fawaz N, Alkhayat A, Zalabany M, Elshinawy M, et al. Coexistence of sickle cell disease and severe congenital neutropenia: first impressions can be deceiving. *Eur J Haematol.* 2012;89(3):245-9.
37. El-Hazmi MA, Warsy AS. A comparative study of haematological parameters in children suffering from sickle cell anaemia (SCA) from different regions of Saudi Arabia. *J Trop Pediatr.* 2001;47(3):136-41.

38. AbdulRahman A, AlAli S, Yaghi O, Shabaan M, Otoom S, Atkin SL, et al. COVID-19 and sickle cell disease in Bahrain. *Int J Infect Dis*. 2020;101:14-6.
39. Fathelrahman M Hassan FMA. Cytokines TNF-Alpha and IL-8 Gene Polymorphisms in Sickle Cell Anaemia Patients under Hydroxyurea Treatment. *Journal of Clinical and Diagnostic Research*. 2018;12(6):EC14-EC7.
40. Chaouch L, Talbi E, Moumni I, Ben Chaabene A, Kalai M, Chaouachi D, et al. Early complication in sickle cell anemia children due to A(TA)_nTAA polymorphism at the promoter of UGT1A1 gene. *Dis Markers*. 2013;35(2):67-72.
41. Shahine R, Badr LK, Karam D, Abboud M. Educational intervention to improve the health outcomes of children with sickle cell disease. *J Pediatr Health Care*. 2015;29(1):54-60.
42. AlFadhli S, Al-Jafer H, Hadi M, Al-Mutairi M, Nizam R. The Effect of UGT1A1 Promoter Polymorphism in the Development of Hyperbilirubinemia and Cholelithiasis in Hemoglobinopathy Patients. *PLOS ONE*. 2013;8(10):e77681.
43. Tantawy AA, Adly AA, Ismail EA, Aly SH. Endothelial nitric oxide synthase gene intron 4 VNTR polymorphism in sickle cell disease: relation to vasculopathy and disease severity. *Pediatr Blood Cancer*. 2015;62(3):389-94.
44. Yousry SM, Ellithy HN, Shahin GH. Endothelial nitric oxide synthase gene polymorphisms and the risk of vasculopathy in sickle cell disease. *Hematology*. 2016;21(6):359-67.
45. Buhazza MA, Bikhazi AB, Khouri FP. Evaluation of haematological findings in 50 Bahraini patients with sickle cell disease and in some of their parents. *J Med Genet*. 1985;22(4):293-5.
46. Al-Awadhi A, Adekile A, Marouf R. Evaluation of von Willebrand factor and ADAMTS-13 antigen and activity levels in sickle cell disease patients in Kuwait. *J Thromb Thrombolysis*. 2017;43(1):117-23.
47. Al-Faris L, Al-Rukhayes M, Al-Humood S. Expression pattern of CD55 and CD59 on red blood cells in sickle cell disease. *Hematology*. 2017;22(2):105-13.
48. Samarah F, Srour MA. Factor V Leiden G1691A and prothrombin G20210A mutations among Palestinian patients with sickle cell disease. *BMC Hematol*. 2018;18:1.
49. el-Hazmi MA, Bahakim HM, al-Swailem AM, Warsy AS. The features of sickle cell disease in Saudi children. *J Trop Pediatr*. 1990;36(4):148-55.
50. el-Hazmi MA, Warsy AS, Addar MH, Babae Z. Fetal haemoglobin level--effect of gender, age and haemoglobin disorders. *Mol Cell Biochem*. 1994;135(2):181-6.
51. Bakioglu I, Hattori Y, Kutlar A, Mathew C, Huisman TH. Five adults with mild sickle cell anemia share a beta S chromosome with the same haplotype. *Am J Hematol*. 1985;20(3):297-300.
52. Abuamer S, Shome DK, Jaradat A, Radhi A, Bapat JP, Sharif KA, et al. Frequencies and phenotypic consequences of association of α - and β -thalassemia alleles with sickle-cell disease in Bahrain. *Int J Lab Hematol*. 2017;39(1):76-83.
53. Warsy AS. Frequency of glucose-6-phosphate dehydrogenase deficiency in sickle-cell disease. A study in Saudi Arabia. *Hum Hered*. 1985;35(3):143-7.
54. El-Hazmi MA, Warsy AS. The frequency of glucose-6-phosphate dehydrogenase phenotypes and sickle cell genes in Al-Qatif oasis. *Ann Saudi Med*. 1994;14(6):491-4.
55. Al-Allawi NA, Al-Dousky AA. Frequency of haemoglobinopathies at premarital health screening in Dohuk, Iraq: implications for a regional prevention programme. *East Mediterr Health J*. 2010;16(4):381-5.
56. Adekile AD, Kutlar F, Haider MZ, Kutlar A. Frequency of the 677 C-->T mutation of the methylenetetrahydrofolate reductase gene among Kuwaiti sickle cell disease patients. *Am J Hematol*. 2001;66(4):263-6.

57. Al-Saqladi AW, Harper G, Delpisheh A, Fijnvandraat K, Bin-Gadeem HA, Brabin BJ. Frequency of the MTHFR C677T polymorphism in Yemeni children with sickle cell disease. *Hemoglobin*. 2010;34(1):67-77.
58. Kalai M, Chaouch L, Mansour IB, Hafsia R, Ghanem A, Abbes S. Frequency of three polymorphisms of the CCL5 gene (rs2107538, rs2280788 and rs2280789) and their implications for the phenotypic expression of sickle cell anemia in Tunisia. *Pol J Pathol*. 2013;64(2):84-9.
59. Hellani A, Al-Akoum S, Abu-Amero KK. G6PD Mediterranean S188F codon mutation is common among Saudi sickle cell patients and increases the risk of stroke. *Genet Test Mol Biomarkers*. 2009;13(4):449-52.
60. el-Hazmi MA, Warsy AS, al-Swailem AR, al-Faleh FZ, al-Jabbar FA. Genetic compounds--Hb S, thalassaemias and enzymopathies: spectrum of interactions. *J Trop Pediatr*. 1994;40(3):149-56.
61. Daar S, Hussain HM, Gravell D, Nagel RL, Krishnamoorthy R. Genetic epidemiology of HbS in Oman: Multicentric origin for the β S gene. *American Journal of Hematology*. 2000;64(1):39-46.
62. Chaouch L, Kalai M, Darragi I, Boudrigua I, Chaouachi D, Ammar SB, et al. Genetic link with cholelithiasis among pediatric SCA Tunisian patients: Examples of UGT1A1, SLCO1A2 and SLCO1B1. *Hematology*. 2016;21(2):121-5.
63. Wainscoat JS, Thein SL, Higgs DR, Bell JI, Weatherall DJ, Al-Awamy BH, et al. A genetic marker for elevated levels of haemoglobin F in homozygous sickle cell disease? *Br J Haematol*. 1985;60(2):261-8.
64. el-Kalla S, Baysal E. Genotype-phenotype correlation of sickle cell disease in the United Arab Emirates. *Pediatr Hematol Oncol*. 1998;15(3):237-42.
65. el-Hazmi MA, al-Swailem A, Warsy AS. Glucose-6-phosphate dehydrogenase deficiency and sickle cell genes in Bisha. *J Trop Pediatr*. 1995;41(4):225-9.
66. El-Hazmi MA, Warsy AS, Bahakim HM, Al-Swailem A. Glucose-6-phosphate dehydrogenase deficiency and sickle cell genes in two regions of western Saudi Arabia. *Ann Saudi Med*. 1993;13(3):250-4.
67. el-Hazmi MA, Warsy AS, Bahakim HH, al-Swailem A. Glucose-6-phosphate dehydrogenase deficiency and the sickle cell gene in Makkah, Saudi Arabia. *J Trop Pediatr*. 1994;40(1):12-6.
68. el-Hazmi MA, Warsy AS. Glutathione reductase deficiency in association with sickle cell and thalassaemia genes in Saudi populations. *Hum Hered*. 1985;35(5):326-32.
69. Shiba HF, El-Ghamrawy MK, Shaheen IAE-M, Ali RAE-G, Mousa SM. Glutathione S-Transferase Gene Polymorphisms (GSTM1, GSTT1, and GSTP1) in Egyptian Pediatric Patients with Sickle Cell Disease. *Pediatric and Developmental Pathology*. 2014;17(4):265-70.
70. Tantawy AA, Adly AA, Ismail EA, Darwish YW, Ali Zedan M. Growth differentiation factor-15 in young sickle cell disease patients: relation to hemolysis, iron overload and vascular complications. *Blood Cells Mol Dis*. 2014;53(4):189-93.
71. El-Hazmi MA. Haemoglobin disorders: a pattern for thalassaemia and haemoglobinopathies in Arabia. *Acta Haematol*. 1982;68(1):43-51.
72. Igala M, Nsame D, Ova JD, Cherkaoui S, Oukkach B, Quessar A. Hashimoto's thyroiditis and acute chest syndrome revealing sickle cell anemia in a 32 years female patient. *Pan Afr Med J*. 2015;21:142.
73. Molchanova TP, Wilson JB, Gu LH, Guemira F, Fattoum S, Huisman TH. Hb Bab-Saadoun or alpha 2 beta (2)48(CD7)Leu----Pro, a mildly unstable variant found in an Arabian boy from Tunisia. *Hemoglobin*. 1992;16(4):267-73.
74. Marouf R, D'Souza T M, Adekile AD. Hemoglobin electrophoresis and hemoglobinopathies in Kuwait. *Med Princ Pract*. 2002;11(1):38-41.

75. Adekile A, Al-Kandari M, Haider M, Rajaa M, D'Souza M, Sukumaran J. Hemoglobin F concentration as a function of age in Kuwaiti sickle cell disease patients. *Med Princ Pract.* 2007;16(4):286-90.
76. Dash S. Hemoglobin SD disease in a Bahraini child. *Bahrain Med Bull.* 1995;17(4):154-5.
77. Dahlawi HA, Zaini R, Zamzami OM, Alhumyani AF. Hemoglobinopathies among Saudi adults at Taif city, Saudi Arabia. *Gematologiya i Transfusiologiya.* 2018;63:159-65.
78. Mohammed AM, Al-Hilli F, Nadkarni KV, Bhagwat GP, Bapat JP. Hemoglobinopathies and glucose-6-phosphate dehydrogenase deficiency in hospital births in Bahrain. *Ann Saudi Med.* 1992;12(6):536-9.
79. el-Hazmi MA. Heterogeneity and variation of clinical and haematological expression of haemoglobin S in Saudi Arabs. *Acta Haematol.* 1992;88(2-3):67-71.
80. Kamel K. Heterogeneity of sickle cell anaemia in Arabs: review of cases with various amounts of fetal haemoglobin. *J Med Genet.* 1979;16(6):428-30.
81. Taha SA, Sharayah A, Salem A, Knox-Macaulay H. Homozygous sickle cell disease and priapism in the eastern province of Saudi Arabia. *Acta Haematol.* 1987;77(1):60-1.
82. El-Hazmi MA, Lehmann H. Human haemoglobins and haemoglobinopathies in Arabia: Hb O Arab in Saudi Arabia. *Acta Haematol.* 1980;63(5):268-73.
83. el-Hazmi MA, Warsy AS, al-Momen A, Harakati M. Hydroxyurea for the treatment of sickle cell disease. *Acta Haematol.* 1992;88(4):170-4.
84. Mallouh AA, Salamah MM. Hypersplenism in homozygous sickle-cell disease in Saudi Arabia. *Ann Trop Paediatr.* 1985;5(3):143-6.
85. Zachariah M, Al Zadjali S, Bashir W, Al Ambusaidi R, Misquith R, Wali Y, et al. Impact of Mannose-Binding Protein Gene Polymorphisms in Omani Sickle Cell Disease Patients. *Mediterr J Hematol Infect Dis.* 2016;8(1):e2016013.
86. Redha NA, Mahdi N, Al-Habboubi HH, Almawi WY. Impact of VEGFA -583C > T polymorphism on serum VEGF levels and the susceptibility to acute chest syndrome in pediatric patients with sickle cell disease. *Pediatr Blood Cancer.* 2014;61(12):2310-2.
87. Simsek M, Daar S, Ojeli H, Bayoumi R. Improved diagnosis of sickle cell mutation by a robust amplification refractory polymerase chain reaction. *Clin Biochem.* 1999;32(8):677-80.
88. Haider MZ, Ashebu S, Aduh P, Adekile AD. Influence of alpha-thalassemia on cholelithiasis in SS patients with elevated Hb F. *Acta Haematol.* 1998;100(3):147-50.
89. Mansour AA. Influence of sickle hemoglobinopathy on growth and development of young adult males in Southern Iraq. *Saudi Med J.* 2003;24(5):544-6.
90. Adekile AD, Tuli M, Haider MZ, Al-Zaabi K, Mohannadi S, Owunwanne A. Influence of α -thalassemia trait on spleen function in sickle cell anemia patients with high HbF. *American Journal of Hematology.* 1996;53(1):1-5.
91. El-Hazmi MAF, Al-Swailem AR, Warsy AS. Liver function tests in sickle cell anemia patients: A case control study in Saudi Arabia. *American Journal of the Medical Sciences.* 1987;293(6):371-6.
92. El Deen MAK, Khorshied MM, El Sadani ZA, Amrousy YM, Galal NM. Mannose-binding lectin (MBL2) gene polymorphism in sickle cell anemia: an Egyptian study. *Comparative Clinical Pathology.* 2013;22(3):387-94.
93. Al-Farsi SH, Al-Riyami NM, Al-Khabori MK, Al-Hunaini MN. Maternal complications and the association with baseline variables in pregnant women with sickle cell disease. *Hemoglobin.* 2013;37(3):219-26.
94. Ben Mustapha M, Mounni I, Zorai A, Douzi K, Ghanem A, Abbes S. Microsatellite and single nucleotide polymorphisms in the β -globin locus control region-hypersensitive Site 2: SPECIFICITY of Tunisian β s chromosomes. *Hemoglobin.* 2012;36(6):533-44.

95. Ali SA. Milder variant of sickle-cell disease in Arabs in Kuwait associated with unusually high level of foetal haemoglobin. *Br J Haematol.* 1970;19(5):613-9.
96. Miller BA, Olivieri N, Salameh M, Ahmed M, Antognetti G, Huisman TH, et al. Molecular analysis of the high-hemoglobin-F phenotype in Saudi Arabian sickle cell anemia. *N Engl J Med.* 1987;316(5):244-50.
97. Elderderly AY, Mills J, Mohamed BA, Cooper AJ, Mohammed AO, Eltieb N, et al. Molecular analysis of the β -globin gene cluster haplotypes in a Sudanese population with sickle cell anaemia. *Int J Lab Hematol.* 2012;34(3):262-6.
98. Makhlof MM, Elwakil SG, Ibrahim NS. Molecular and serological assessment of parvovirus B-19 infection in Egyptian children with sickle cell disease. *J Microbiol Immunol Infect.* 2017;50(5):565-9.
99. Al Arrayed SS, Jassim N. Molecular basis of benign form of sickle cell - B thalassemia syndrome in two Bahraini patients. *Bahrain Medical Bulletin.* 2006;28(4):168-70.
100. el-Hazmi MA, Warsy AS. Molecular studies on Yemeni sickle-cell-disease patients: Xmn I polymorphism. *East Mediterr Health J.* 1999;5(6):1183-7.
101. Adekile AD, Haider MZ. Morbidity, beta S haplotype and alpha-globin gene patterns among sickle cell anemia patients in Kuwait. *Acta Haematol.* 1996;96(3):150-4.
102. Chaouch L, Sellami H, Kalai M, Darragi I, Boudrigua I, Chaouachi D, et al. New Deletion at Promoter of HBG1 Gene in Sickle Cell Disease Patients With High HbF Level. *J Pediatr Hematol Oncol.* 2020;42(1):20-2.
103. Alenzi FQ. New mutations of locus control region in Saudi sickle patients. *Saudi J Biol Sci.* 2020;27(5):1265-70.
104. Ramachandran M, Gu LH, Wilson JB, Kitundu MN, Adekile AD, Liu JC, et al. A new variant, HB Muscat [α 2 β (2)32(B14)Leu----Val] observed in association with HB S in an Arabian family. *Hemoglobin.* 1992;16(4):259-66.
105. al-Hazaa S, Bird AC, Kulozik A, Serjeant BE, Serjeant GR, Thomas P, et al. Ocular findings in Saudi Arabian patients with sickle cell disease. *Br J Ophthalmol.* 1995;79(5):457-61.
106. al-Salem M, Ismail L. Ocular manifestations of sickle cell anaemia in Arab children. *Ann Trop Paediatr.* 1990;10(2):199-202.
107. AlRyalat SA, Jaber BAM, Alzarea AA, Alzarea AA, Alosaimi WA, Al Saad M. Ocular Manifestations of Sickle Cell Disease in Different Genotypes. *Ophthalmic Epidemiol.* 2021;28(3):185-90.
108. el-Hazmi MA, Warsy AS. On the molecular interactions between alpha-thalassaemia and sickle cell gene. *J Trop Pediatr.* 1993;39(4):209-13.
109. el-Hazmi MA, Warsy AS. On the nature of sickle cell disease in the south-western province of Saudi Arabia. *Acta Haematol.* 1986;76(4):212-6.
110. El-Hazmi MA. On the nature of sickle-cell disease in the Arabian Peninsula. *Hum Genet.* 1979;52(3):323-35.
111. el-Hazmi MA, al-Momen A, Kandaswamy S, Huraib S, Harakati M, al-Mohareb F, et al. On the use of hydroxyurea/erythropoietin combination therapy for sickle cell disease. *Acta Haematol.* 1995;94(3):128-34.
112. Ganesh A, Al-Zuhaibi S, Pathare A, William R, Al-Senawi R, Al-Mujaini A, et al. Orbital infarction in sickle cell disease. *Am J Ophthalmol.* 2008;146(4):595-601.
113. Haseeb YA, Al Qahtani NH. Outcome of Pregnancy in Saudi Women with Sickle Cell Disease Attending the Tertiary Care University Hospital in Eastern Province of Saudi Arabia. *Afr J Reprod Health.* 2019;23(3):42-8.
114. el-Hazmi MA, Warsy AS. Pattern for alpha-thalassaemia in Yemeni sickle-cell-disease patients. *East Mediterr Health J.* 1999;5(6):1159-64.

115. Mallouh AA, Salamah MM. Pattern of bacterial infections in homozygous sickle cell disease. A report from Saudi Arabia. *Am J Dis Child*. 1985;139(8):820-2.
116. El-Hazmi MA, Jabbar FA, Al-Faleh FZ, Al-Swailem AR, Warsy AS. Patterns of sickle cell, thalassaemia and glucose-6-phosphate dehydrogenase deficiency genes in north-western Saudi Arabia. *Hum Hered*. 1991;41(1):26-34.
117. el-Hazmi MA, al-Momen A, Warsy AS, Kandaswamy S, Huraib S, Harakati M, et al. The pharmacological manipulation of fetal haemoglobin: trials using hydroxyurea and recombinant human erythropoietin. *Acta Haematol*. 1995;93(2-4):57-61.
118. el-Hazmi MA, Warsy AS, al-Fawaz I, Opawoye AO, Taleb HA, Howsawi Z, et al. Piracetam is useful in the treatment of children with sickle cell disease. *Acta Haematol*. 1996;96(4):221-6.
119. Al-Qadheeb N, Hashhoush M, Maghrabi K, Rugaan A, Eltatar F, Algethamy H, et al. Point prevalence of delirium among critically ill patients in Saudi Arabia: A multicenter study. *Indian Journal of Ophthalmology*. 1991;39(1):9-11.
120. Haghpanah S, Nasirabadi S, Kianmehr M, Afrasiabi A, Karimi M. Polymorphisms associated with sickle cell disease in Southern Iran. *Russian Journal of Genetics*. 2012;48(7):755-7.
121. Safwat NA, MM EL, Abdel-Wahab SEA, Hamza MT, Boshnak NH, Kenny MA. Polymorphisms of the receptor for advanced glycation end products as vasculopathy predictor in sickle cell disease. *Pediatr Res*. 2021;89(1):185-90.
122. el-Shafei AM, Dhaliwal JK, Sandhu AK. Pregnancy in sickle cell disease in Bahrain. *Br J Obstet Gynaecol*. 1992;99(2):101-4.
123. Hamdy MSE-D, Gouda HM, Shaheen IA-M, Khorshied MM, Tomerak RH. Prevalence of factor V Leiden (G1619A) and prothrombin gene (G20210A) mutation in Egyptian children with sickle cell disease. *Comparative Clinical Pathology*. 2013;22(4):697-702.
124. Sunna EI, Gharaibeh NS, Knapp DD, Bashir NA. Prevalence of hemoglobin S and beta-thalassemia in northern Jordan. *J Obstet Gynaecol Res*. 1996;22(1):17-20.
125. Faidah H, Samy M, Tashkandi AA. Prevalence of Sickle Cell Anemia and Thalassemia among Anemic Patients of Al-Noor Specialist Hospital, Makkah, KSA. *Biosciences Biotechnology Research Asia*. 2013;10:23-7.
126. Khorshied MM, Mohamed NS, Hamza RS, Ali RM, El-Ghamrawy MK. Protein Z and Endothelin-1 genetic polymorphisms in pediatric Egyptian sickle cell disease patients. *J Clin Lab Anal*. 2018;32(2).
127. Mahdi N, Abu-Hijleh TM, Abu-Hijleh FM, Sater MS, Al-Ola K, Almawi WY. Protein Z polymorphisms associated with vaso-occlusive crisis in young sickle cell disease patients. *Ann Hematol*. 2012;91(8):1215-20.
128. Aleem A. Proteinuria in adult Saudi patients with sickle cell disease is not associated with identifiable risk factors. *Saudi Journal of Kidney Diseases and Transplantation*. 2010;21(5):903-8.
129. Dahoui HA, Hayek MN, Nietert PJ, Arabi MT, Muwakkit SA, Saab RH, et al. Pulmonary hypertension in children and young adults with sickle cell disease: Evidence for familial clustering. *Pediatric Blood & Cancer*. 2010;54(3):398-402.
130. el-Hazmi MA, Warsy AS, al-Swailem A, al-Swailem A, Bahakim H. Red cell genetic disorders and plasma lipids. *J Trop Pediatr*. 1995;41(4):202-5.
131. Sahli CA, Bibi A, Ouali F, Fredj SH, Dakhlaoui B, Othmani R, et al. Red cell indices: differentiation between β -thalassaemia trait and iron deficiency anemia and application to sickle-cell disease and sickle-cell thalassaemia. *Clin Chem Lab Med*. 2013;51(11):2115-24.
132. Ellithy HN, Yousri S, Shahin GH. Relation between glutathione S-transferase genes (GSTM1, GSTT1, and GSTP1) polymorphisms and clinical manifestations of sickle cell disease in Egyptian patients. *Hematology*. 2015;20(10):598-606.

133. Al-Habboubi HH, Mahdi N, Abu-Hijleh TM, Abu-Hijleh FM, Sater MS, Almawi WY. The relation of vascular endothelial growth factor (VEGF) gene polymorphisms on VEGF levels and the risk of vasoocclusive crisis in sickle cell disease. *Eur J Haematol.* 2012;89(5):403-9.
134. El-Akawi ZJ, Al-Remawi HS, Al-Namarneh KJ. The relationship between the type of mutation in the globin gene and the type and severity of sickle/beta-thalassemia disease in Jordanian patients. *Saudi Med J.* 2009;30(7):967-8.
135. el-Hazmi MA. The relationship of the genetic heterogeneity of sickle cell gene to clinical manifestations. *J Trop Pediatr.* 1993;39(1):23-9.
136. Mohammed AO, Attalla B, Bashir FM, Ahmed FE, El Hassan AM, Ibnauf G, et al. Relationship of the sickle cell gene to the ethnic and geographic groups populating the Sudan. *Community Genet.* 2006;9(2):113-20.
137. Imen M, Ikbel BM, Leila C, Fethi M, Amine Z, Mohamed B, et al. Restriction mapping of β S locus among Tunisian sickle-cell patients. *Am J Hum Biol.* 2011;23(6):815-9.
138. Adekile AD, Gupta R, Al-Khayat A, Mohammed A, Atyani S, Thomas D. Risk of avascular necrosis of the femoral head in children with sickle cell disease on hydroxyurea: MRI evaluation. *Pediatr Blood Cancer.* 2019;66(2):e27503.
139. Kalai M, Dridi M, Chaouch L, Moumni I, Ouragini H, Darragi I, et al. The role of rs1984112_G at CD36 gene in increasing reticulocyte level among sickle cell disease patients. *Hematology.* 2017;22(3):178-82.
140. Isma'eel H, Arnaout MS, Shamseddeen W, Mahfouz R, Zeineh N, Jradi O, et al. Screening for inherited thrombophilia might be warranted among Eastern Mediterranean sickle-beta-0 thalassemia patients. *J Thromb Thrombolysis.* 2006;22(2):121-3.
141. Adekile AD, Haider MZ, Serebour F, Al-Zaabi K, Tuli M. Serum Immunoglobulins and IgG Subclasses in SS Patients with Saudi Arabia/India Haplotype. *Medical Principles and Practice.* 1999;8(3):183-8.
142. Alkindi SY, Pathare A, Al Zadjali S, Panjwani V, Wasim F, Khan H, et al. Serum Total Bilirubin, not Cholelithiasis, is Influenced by UGT1A1 Polymorphism, Alpha Thalassemia and β (s) Haplotype: First Report on Comparison between Arab-Indian and African β (s) Genes. *Mediterr J Hematol Infect Dis.* 2015;7(1):e2015060.
143. al-Sheyyab M, Rimawi H, Izzat M, Batieha A, el Bashir N, Almasri N, et al. Sickle cell anaemia in Jordan and its clinical patterns. *Ann Trop Paediatr.* 1996;16(3):249-53.
144. Mohamed AO, Bayoumi RA, Hofvander Y, Omer MI, Ronquist G. Sickle cell anaemia in Sudan: clinical findings, haematological and serum variables. *Ann Trop Paediatr.* 1992;12(2):131-6.
145. Jain RC. Sickle cell and thalassaemic genes in Libya. *Transactions of the Royal Society of Tropical Medicine and Hygiene.* 1985;79(1):132-3.
146. Hassan SM, Al Muslahi M, Al Riyami M, Bakker E, Harteveld CL, Giordano PC. Sickle cell anemia and α -thalassemia: a modulating factor in homozygous HbS/S patients in Oman. *Eur J Med Genet.* 2014;57(11-12):603-6.
147. Abbes S, Fattoum S, Vidaud M, Goossens M, Rosa J. Sickle cell anemia in the Tunisian population: haplotyping and HB F expression. *Hemoglobin.* 1991;15(1-2):1-9.
148. Belhani M, Morle L, Godet J, Bachir D, Henni T, Zerhouni F, et al. Sickle cell beta-thalassaemia compared with sickle cell anaemia in Algeria. *Scand J Haematol.* 1984;32(4):346-50.
149. Mohammad AM, Ardatl KO, Bajakian KM. Sickle cell disease in Bahrain: coexistence and interaction with glucose-6-phosphate dehydrogenase (G6PD) deficiency. *J Trop Pediatr.* 1998;44(2):70-2.
150. Gelpi AP. Sickle cell disease in Saudi Arabs. *Acta Haematol.* 1970;43(2):89-99.
151. Bayoumi RA, Zeid YAA, Sadig AA, Elkarim OA. Sickle cell disease in Sudan. *Transactions of the Royal Society of Tropical Medicine and Hygiene.* 1988;82(1):164-8.

152. Al-Ali AK, Alsulaiman A, Alfarhan M, Safaya S, Vatte CB, Albuali WM, et al. Sick cell disease in the Eastern Province of Saudi Arabia: Clinical and laboratory features. *Am J Hematol.* 2021;96(4):E117-e21.
153. Al-Allawi NA, Jalal SD, Nerwey FF, Al-Sayan GO, Al-Zebari SS, Alshingaly AA, et al. Sick cell disease in the Kurdish population of northern Iraq. *Hemoglobin.* 2012;36(4):333-42.
154. Alabdulaali MK. Sick cell disease patients in eastern province of Saudi Arabia suffer less severe acute chest syndrome than patients with African haplotypes. *Ann Thorac Med.* 2007;2(4):158-62.
155. Hamzi K, Itto AB, Jouhadi Z, Slassi I, Nadifi S. Sick cell disease with double stroke in a Moroccan family. *J Mol Neurosci.* 2013;50(2):311-3.
156. Inati A, Jradi O, Tarabay H, Moallem H, Rachkidi Y, El Accaoui R, et al. Sick cell disease: the Lebanese experience. *Int J Lab Hematol.* 2007;29(6):399-408.
157. Saha N, Samuel AP. Sick cell gene and liver functions in a Sudanese population. *Acta Haematol.* 1982;68(1):65-7.
158. el-Hazmi MA, Warsy AS, al-Swailem AR, al-Swailem AM, Bahakim HM. Sick cell gene in the population of Saudi Arabia. *Hemoglobin.* 1996;20(3):187-98.
159. Jaiyesimi F, Pandey R, Bux D, Sreekrishna Y, Zaki F, Krishnamoorthy N. Sick cell morbidity profile in Omani children. *Ann Trop Paediatr.* 2002;22(1):45-52.
160. el-Hazmi MA, Al-Swailem AR. Sick cell-beta 0-thalassaemia in Saudi Arabia. *Hum Hered.* 1987;37(4):211-6.
161. Knox-Macaulay HH, Ahmed MM, Gravell D, Al-Kindi S, Ganesh A. Sick cell-haemoglobin E (HbSE) compound heterozygosity: a clinical and haematological study. *Int J Lab Hematol.* 2007;29(4):292-301.
162. Bashir N, Barkawi M, Sharif L. Sick cell/beta-thalassemia in North Jordan. *J Trop Pediatr.* 1992;38(4):196-8.
163. Adekile AD, Akbulut N, Azab AF, Al-Sharida S, Thomas D. The Sick cell β -Thalassemia Phenotype. *J Pediatr Hematol Oncol.* 2017;39(5):327-31.
164. Ibrahim SA, Mustafa D. Sick cell-haemoglobin O disease in a Sudanese family. *Br Med J.* 1967;3(5567):715-7.
165. Al Moamen NJ, Mahdi F, Salman E, Ahmed T, Abbas R, Al Arrayed S, et al. Silent β -thalassaemia mutations at -101 (C>T) and -71 (C>T) and their coinheritance with the sickle cell mutation in Bahrain. *Hemoglobin.* 2013;37(4):369-77.
166. Sumer T, al-Mulhim I, Abumelha A, Ahmed MA, Khawaja S. Splenectomy in compound heterozygous hemoglobinopathies in Saudi Arabia. *Am J Pediatr Hematol Oncol.* 1990;12(3):306-9.
167. Wali YA, Al-Lamki Z, Hussein SS, Bererhi H, Kumar D, Wasifuddin S, et al. Splenic function in Omani children with sickle cell disease: correlation with severity index, hemoglobin phenotype, iron status, and alpha-thalassaemia trait. *Pediatr Hematol Oncol.* 2002;19(7):491-500.
168. el-Hazmi MA. Studies on sickle cell heterozygotes in Saudi Arabia--interaction with alpha-thalassaemia. *Acta Haematol.* 1986;75(2):100-4.
169. Mahmoud HM, Shoeib AA, Abd El Ghany SM, Reda MM, Ragab IA. Study of alpha hemoglobin stabilizing protein expression in patients with β thalassaemia and sickle cell anemia and its impact on clinical severity. *Blood Cells Mol Dis.* 2015;55(4):358-62.
170. Adekile AD, Al-Sherida S, Marouf R, Mustafa N, Thomas D. The Sub-Phenotypes of Sick Cell Disease in Kuwait. *Hemoglobin.* 2019;43(2):83-7.
171. Al Balushi HWM, Wali Y, Al Awadi M, Al-Subhi T, Rees DC, Brewin JN, et al. The super sickling haemoglobin HbS-Oman: a study of red cell sickling, K(+) permeability and associations with

- disease severity in patients heterozygous for HbA and HbS-Oman (HbA/S-Oman genotype). *Br J Haematol.* 2017;179(2):256-65.
172. Akar NA, Adekile A. Ten-year review of hospital admissions among children with sickle cell disease in Kuwait. *Med Princ Pract.* 2008;17(5):404-8.
173. Alsulmi HA. Testicular infarction in a patient with sickle cell anemia: A case report. *Int J Health Sci (Qassim).* 2018;12(5):100-2.
174. Raghupathy R, Haider MZ, Azizieh F, Abdelsalam R, D'Souza TM, Adekile AD. Th1 and Th2 cytokine profiles in sickle cell disease. *Acta Haematol.* 2000;103(4):197-202.
175. Adekile A, Hassan M, Asbeutah A, Al-Hinai M, Trad O, Farhan N. Transcranial Doppler Ultrasound in Peninsular Arab Patients With Sickle Cell Disease. *J Ultrasound Med.* 2019;38(1):165-72.
176. el-Hazmi MA, Jabbar FA, Al-Faleh FZ, Warsy AS. Triple alpha genes in association with sickle cell and beta-thalassaemia gene in the Saudi population. *Acta Haematol.* 1987;77(3):161-5.
177. el-Hazmi MA, Warsy AS. Triple alpha-genes (alpha alpha alpha anti3.7) in a patient with sickle cell anaemia. *Hum Hered.* 1992;42(6):360-6.
178. Raghupathy R, Haider MZ, Azizieh F, D'Souza TM, Abdelsalam R, Adekile AD. Tumor necrosis factor-alpha is undetectable in the plasma of SS patients with elevated Hb F. *Am J Hematol.* 2000;64(2):91-4.
179. Al-Madhani A, Pathare A, Al Zadjali S, Al Rawahi M, Al-Nabhani I, Alkindi S. The Use of HPLC as a Tool for Neonatal Cord Blood Screening of haemoglobinopathy: A Validation Study. *Mediterr J Hematol Infect Dis.* 2019;11(1):e2019005.
180. Mellouli F, Bejaoui M. [The use of hydroxyurea in severe forms of sickle cell disease: study of 47 Tunisian paediatric cases]. *Arch Pediatr.* 2008;15(1):24-8.
181. Sidani CA, Ballourah W, El Dassouki M, Muwakkit S, Dabbous I, Dahoui H, et al. Venous sinus thrombosis leading to stroke in a patient with sickle cell disease on hydroxyurea and high hemoglobin levels: treatment with thrombolysis. *Am J Hematol.* 2008;83(10):818-20.
182. el-Hazmi MA. Xmn I polymorphism in the gamma-globin gene region among Saudis. *Hum Hered.* 1989;39(1):12-9.
183. Alaoui-Ismaïli FZ, Laghmich A, Ghailani-Nourouti N, Barakat A, Bennani-Mechita M. XmnI Polymorphism in Sickle Cell Disease in North Morocco. *Hemoglobin.* 2020;44(3):190-4.
184. Abou-Elew HH, Youssry I, Hefny S, Hashem RH, Fouad N, Zayed RA. $\beta(S)$ globin gene haplotype and the stroke risk among Egyptian children with sickle cell disease. *Hematology.* 2018;23(6):362-7.