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Background: Acute chest syndrome (ACS) is the second leading cause of hospitalization and the most common cause for death among adult patients with sickle cell disease (SCD). It is a lung injury syndrome. Its pathophysiology is complex and associates, at different levels, vaso-occlusion, fat embolism, infection, *in situ* thromboembolism, hemolysis related vasoconstriction, hypoventilation. The evolution can be severe and drive to acute respiratory distress syndrome and/or acute pulmonary hypertension with acute cor pulmonale. Treatment is symptomatic. It is still difficult to predict which patients will have severe disease or develop life-threatening hypoxemia.
Aims: The goals of this non-interventional retrospective study were to describe the characteristics of ACS in an SCD affected adult population attending the referral centre for sickle cell disease in Guadeloupe and to identify predictive factors of severity
Methods: The CHU de Guadeloupe has the agreement (CNIL-2006302 v) from the French national Committee for computerized Databases for MR3 non interventional Studies. All patients with SCD, who were hospitalized at the University Hospital of Guadeloupe or at the Hospital of la Basse-Terre from January 1st 2011 to december 31st 2014 because of the occurrence of ACS, were included. The data were collected from the patients'medical files and included demographic data, sickle cell and non-sickle cell related medical antecedents, current treatment, the more recent biological steady state values, clinical symptoms before admission and at admission, radiological signs at admission, clinical evolution after admission, biological parameters evolution during hospitalization, transfer or not to Intensive Care Unit (ICU), transfusion therapy and the issue of the episode. Two groups were compared, according to the occurrence of a severe ACS, defined by clinical worsening, and/or an ICU stay of more than 48h, and/or the need for ventilatory support.
Results: During the study period, 71 episodes of ACS with 41 (58%) severe episodes were recorded. To be a younger adult (p=0.01), to have lower steady hematocrit level (p=0.013), long term treatment for SCD-related nephropathy by angiotensin-converting enzyme (ACE)-inhibitors and/or angiotensin receptor blockers (p=0.035), pregnancy for women patients (p=0.016), higher heart rate at admission (p=0.004), higher temperature at admission (p=0.01), lower limb located pain (p=0.035), higher leukocytes count (p=0.042), higher serum bilirubin, lacticodehydrogenase and C reactive protein levels at admission (p=0.002, 0.046 and 0.013 respectively) were associated with severe episodes. The multivariate analysis showed that to be younger than 28 years old, to have steady state hematocrit level lower than 25% and long term treatment for SCD-related nephropathy by angiotensin-converting enzyme (ACE)-inhibitors and/or angiotensin receptor blockers are independent factors associated with the severity of this complication in our population
Summary and Conclusions: Younger adults, pregnancy in SCD women, SCD nephropathy, and higher hemolysis level were associated with more severe ACS in adults with SCD in our study. A large-scale prospective study is needed to investigate the influence of these factors on the development of severe ACS in order to identify the patients who should benefit from early aggressive treatment in order to reduce mortality associated with this severe complication.

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COULD LIVER INVOLVEMENT BE EARLY DETECTED IN SICKLE CELL DISEASE?

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Background: Liver damage is a severe and frequent complication in Sickle Cell Disease (SCD), mainly characterized by intra-hepatic cholestasis. So far, no effective approaches to prevent or treat this condition are established.
Aims: Clinical, laboratory and imaging findings are evaluated longitudinally in SCD patients, comparing different sickle-genotypes, in order to identify possible early predictors of liver involvement.
Methods: Sixty-eight SCD patients were studied: 17 Sickle Cell Anemia (SCA, median age 42.8±10.3yrs, M:F 4:13), 38 Sickle Cell Thalassemia (HbS-βThal, 45.2±9.4yrs, M:F 14:24) and 13 HbS/HbC (HbSC, 35.6±8.7yrs, M:F 5:8). Patients with at least two Stiffness data (Transient Elastography TE) (T0 and T1), measured out of sickle crisis, were retrospectively evaluated (2007-2016). Liver function tests, HBV, HCV, iron status, and hemolytic indices, were recorded. Abdominal ultrasound (US) and Magnetic Resonance Imaging (MRI) T2* were also collected.
Results: In SCA pts Hb were 9±0.92 g/dL, HbS% 67.9±18.2% and HbF% 8.08±5.36; in HbS-βThal Hb 10±1.59, HbS 63.4±14.2% and HbF% 12.1±9.03; in HbSC Hb 11.9±1.1 (25.9-83.1), HbS 46.4±1% and HbF% 1.53±1.3 (SCA *vs* HbSC and HbS-βThal *vs* HbSC <0.0001).
Considering clinical manifestations, 76.5% of SCA, 60.5% of HbS-βThal and 30.8% of HbSC pts had >1 vaso-occlusive crisis during the decade (VOCs)/yr (SCA *vs* HbSC p=0.02; SCA *vs* HbS-βThal p=0.36; HbS-βThal *vs* HbSC p=00.1). Occasional transfusions (<4 RBCs Units/yr) occurred in 88.2% of SCA, 84.2% of HbS-βThal and 61.5% of HbSC pts. Hydroxy-Carbamide was prescribed to 58.8% of SCA, 65.8% of HbS-βThal and 15.4% of HbSC pts and iron-chelators to 23.5% of SCA, 23.7% of HbS-βThal and none of HbSC pts. At T0 AST, ALT, LDH were statistically higher in SCA pts than in HbS-βThal and HbSC (ALT p<0.0001) and in HbS-βThal compared to HbSC (ALT p=0.01). GGT, ALP were higher in SCA than in HbS-βThal and HbSC (GGT p=0.013; ALP p=0.006), but without statistical significance in HbS-βThal compared to HbSC (GGT p=0.23; ALP p=0.44). Liver synthesis indices were similar in the three subgroups; none was neither HbsAg nor HCV-RNA positive. No differences were found comparing laboratory indices at T0 and T1. TE Stiffness was statistically higher in SCA (KPa 8.3±6.86) than in HbSC pts (KPa 5.33±2.15; p=0.014). In HbS-βThal (KPa 6.17±2.58) was increased but not statistically significant compared to either SCA and HbSC pts (p=0.2). Liver Iron Concentration (LIC) (derived from MRI T2*) was higher in HbS-βThal than in SCA and HbSC pts (HbS-βThal *vs* HbSC p=0.0145) and in SCA comparing HbSC (p=0.018). Univariate analysis was performed to correlate GGT with ferritin (p=0.02), TE (p=0.002), US (p=0.107) and LIC (p=0.511) in all SCD pts. A good correlation between GGT and US liver echogenicity was present in SCA and HbS-βThal pts, with GGT values respectively 20% and 160% higher than normal. TE and US (p=0.045) in all SCD pts correlated positively. No differences were found in TE and MRI T2* at T0 and T1. US showed significant differences at T0 compared with T1 in HbS-βThal (p=0.04) and in HbSC pts (p=0.001), but not in SCA pts (p=0.46) probably because of higher Stiffness since T0. Multivariate analysis showed as independent risk factors: sex (male), low HbF values, high ferritin values, more severe sickle genotype as predictors of liver involvement.
Summary and Conclusions: Function liver tests associated with US, TE and when possible to MRI T2* taking into account sex, percentage of HbF, and SCD genotypes, are important to early detect and follow the sickle hepatopathy.