Electrocardiographic patterns in a young and healthy Algerian population

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Objective: Electrocardiographic characteristics and abnormalities in the Maghrebian population haven’t yet been well described. The aim of this study was to evaluate the prevalence of electrocardiographic abnormalities in this population by screening a sample group of apparently healthy young Algerian persons.

Methods: A prospective observational study was performed using a sample group of 441 healthy male and female subjects (mean age 25; ranges from 18 to 36). All the subjects underwent a cardiac evaluation which comprised a medical history, a physical examination and a 12-lead electrocardiogram (ECG) at rest. The ECGs were analysed by three independent cardiologists.

Results: The participants were asymptomatic, with no history of sudden cardiac death. Their physical exam was normal. The mean HR was 75 bpm, the mean PQ, QRS and QTc duration was 150 ms, 78 ms and 402 ms, respectively. The mean QRS axis was 54°. 24 subjects (5.4%) were found with Left ventricular hypertrophy (Sokolow index >35 mm). First degree AV block was present in 15 patient (3.4%). 3 participants were found with a complete RBBB (0.6%), and 1 subject had a complete LBBB (0.2%). Curiously the cases of incomplete LBBB (22; 5%) were 4 times more often than the incomplete RBBB cases (5; 1%). A QRS axis <–30° was found in 7 patients and 1 patient had an axis >120°. There were no short QTc (<320 ms). 7 (1.6%) cases of long QTc (>460 ms) were discovered.

Conclusion: In our study, 76 patients, meaning 17.2% of the participants were found with an ECG abnormality but without presenting any symptoms or abnormalities at the clinical examination. These data suggest that guidelines for the CGs analysis should be adjusted to the target population.

Early repolarization variant frequently detected in young adults in Algeria

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Background: Early repolarization variant (ERV) is a common finding among a young healthy Maghrebian population. Its prevalence in the Algerian population is unknown. The aim of this study was to appreciate the prevalence of the ERV within a sample group of healthy Algerian young adults.

Methods: ERV prevalence was assessed within a sample group of 441 healthy male and female subjects (average age: 25 years old; age ranges: 18 to 36 years old) using 12-lead electrocardiography. Three independent cardiologists interpreted the ECGs and ERV was stratified according to the J-point elevation (≥0.1 mV) in the inferior, apicalateral or both leads associated with QRS sharring or notching.

Results: The ERV pattern was found in 55 subjects (12.4%). A malignant ERV (>2 mm) was discovered in 5 subjects (0.9%). Seventeen subjects (3.8%) presented the ERV pattern in the lateral leads, 16 (3.6%) in the inferior leads, and 22 (5%) in both lateral and inferior leads. Notch pattern was present in 14 subjects (3.2%), slur pattern in 30 subjects (6.8%), and a combination of the two patterns in 11 subjects (2.5%). The ERV pattern was more prevalent in males (15.6%) than in females (11.2%). The ERV prevalence was not higher among the youngest subjects. None of the participants experienced symptoms nor had a history of familial sudden death.

Conclusion: ERV is a common finding among a young healthy Algerian population. Its prevalence seems to be more important than in highly developed countries.
Acute atrioventricular block in hemodialysis patients: screening, diagnosis and treatment

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Background: Systemic calcifications are a common finding in chronic renal disease. However, cardiac involvement is especially ominous and leads to conduction defects and arrhythmia that may cause sudden death.

Patients and Methods: Prospective study screening 52 hemodialysis patients for cardiac arrhythmia using ECG and 24 h Holter-ECG monitoring including hemodialysis sessions. Patients with symptomatic atrioventricular block (AVB) were treated by permanent pacing and underwent echocardiography and 64-slice spiral cardiac CT scanner (CCTS) to assess the presence and localisations of cardiac calcifications, and to determine Agatston coronary calcium scoring (ACCS).

Results: Atrioventricular block was found in 4 patients (7.7%); 4 men, mean aged 61 years with a mean hemodialysis duration of 83.25 months. Two patients were diabetic and hypertensive and one had ischemic cardiomyopathy history. Clinical symptoms were especially fatigue and unconsciousness. One case of reversible cardiopulmonary arrest was noted. ECG and Holter-ECG revealed complete atrioventricular block in all cases. Mitral valve calcifications were present in 2 patients, 2 subjects had aortic valve calcifications and left ventricular hypertrophy. Systolic function was normal in 3 cases. CCTS demonstrates a high ACCS (>401) in two cases with a special involvement of anterior interventricular artery. No short or long-term complications related to pacemaker implantation were encountered.

Conclusion: Cardiovascular calcifications are associated with several disturbances of the conduction system in maintenance hemodialysis, and leads to substantial morbidity and mortality. Many risk factors are established such as advanced age and duration of dialysis. In our patients, AVB was additionally attributed to metastatic calcifications involving the cardiac valves and the coronary arteries consecutive to long-term exposure to imbalances in mineral metabolism and the use of calcium carbonate as phosphate binder and vitamin D to treat secondary hyperparathyroidism. More attention should be focused on screening of conduction defects by Holter ECG in earlier chronic renal disease to avoid consequent mortality.

Materials and Methods: ten patients of afro caribbean were hospitalized for acute atrioventricular block and followed at least 1 month. Six male and four female has a diagnosis of SCD using Hb electrophoresis received regular laboratory, Chest ray and physical evaluation completed with EKG and echocardiography and a chronic transfusion therapy for primary stroke prevention requires careful surveillance for iron overload and chelation therapy; all the patients used daily antibiotic until five years and annual influenza and pneumococcal vaccination. Blood samples with Hb electrophoresis, blood counts, Emmel test on blood film, bacteriology and room air arterial gas sampling was performed in all patients.

Results: the most common presenting symptoms were anemia, bradycardia under 35 ppm with mid cardiac attack, cough fever, one acute chest syndrome, shortness of breath, no heart failure or valvular endocarditis. The frequency of symptom was not age dependent between Hb SS or Hb SC. Four patients had a type 2 atrioventricular block with thin QRS, six patients with a completed atrioventricular block, no indication of cardiac pacing was done. Laboratory findings documented during hospitalization showed a significant change with hemoglobin dropping an average of 7 g/dl and an increasing of white blood cell also during ACS (one patient). No bacteremia was documented and the seasonal variation was observed in winter, young patients was most striking with an increased rate into the winter. Echocardiography was performed with a mild left ventricular dilatation overload, a preserved LVEF, a mild left atrial dilatation, no pericardial effusion and no arterial pulmonary hypertension or endocarditis. SCD was once thought to involve solely the polymerisation of Hb S, vasocclusion involves leukocytes and altered nitric oxyd metabolism, hypercoagulability provided understanding of the physiopathology of this disease had led to new opportunities to improve patient care.

Acute atrioventricular block in african or caribbean patients consider sickle cell anemia

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We report ten rare cardiac complications of sickle cell anemia in blacks patients which was an acute paroxysmal atrioventricular block. Six male and four female with a average age of 39 + 4 years, had an heterozygous genotype (three patients) or homozygous in six patients (SS/SC) one patient had a heterozygous genotype with a βthalassemia were observed for a acute paroxysmal atrioventricular block.

Power spectral analysis of heart rate variability: a comparative study with beagle dogs and cynomolagus monkeys

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Introduction: Power spectral analysis of heart rate variability is a tool known to provide information of interest on the autonomic control of heart rate in human. However, its use and its conditions of application and interpretation are not well defined for cardiovascular safety pharmacology studies. Likewise, data of power spectral analysis of heart rate variability in cynomolagus monkeys are not available. This study was designed to evaluate the relevance of this biomarker in this non human primate species, and to compare results with those from beagle dogs.

Methods: Power spectral analysis of heart rate variability was performed on data collected in both species by telemetry. Various pharmacological agents were tested in order to compare the profile of responses in both species after modifying the autonomic nervous balance.

Results: Heart rate variability in the cynomolagus monkey is mainly driven by the parasympathetic nervous system as in beagle dogs although vagal tone is less than in dogs. Power spectral analysis of heart rate variability allows detection of interaction with the autonomic nervous system in both species in all investigated situations, i.e. sympatholytic/sympathomimetic and parasympatholytic/parasympathomimetic drug induced effects. However, due to species difference in the autonomic control of heart rate, cynomolagus monkeys are likely to be more sensitive than beagle dogs for assessment of sympatholytic properties.

Discussion: This study confirms that power spectral analysis of heart rate variability from data derived from ECG recordings in telemetry studies is applicable for detection of interaction with the autonomic nervous system and may provide in either species relevant information for interpretation of electrocardiographic changes, in particular on ventricular repolarisation, induced by new drug entities under evaluation. However, interspecies differences in autonomic control must be taken into account when interpreting possible drug effects.
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Electrocardiogram interpretation by military general practitioner in asymptomatic subjects: professional practice assessment

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Introduction: Joining the french military forces requires a physical examination and an ECG. This function is devolved to military general practitioners. The quality of their ECG interpretation has been assessed in a professional practice audit (PPA).

Materials and Methods: From September 2009 to April 2010 we lead a prospective study in four military units. The aim was to compare the ECG reading of military GPs with cardiology. Interpretations were randomized and standardized.

Results: 1183 ECGs were included, from a population of 32 years average age, predominantly male (90%). 293 had one or more atypical pattern, the most common being the early repolarization (196, or 16.6% of ECG). 25 showed an abnormality requiring cardiologist’s advice. The overall concordance rate between the interpretation of military GP and the cardiologist was 72%. Detecting abnormalities in medical unit was incomplete with a sensitivity of 33%, a specificity of 99%. The positive predictive value of requests for cardiologist’s advice prescribed by the military physician was 64%.

Conclusion: ECG reading by military GPs is useful and sufficient in most of cases. To improve and secure our practice it is necessary to strengthen the link between GPs and cardiology. Tools such as the establishment of a reading grid, using a telemedicine network, as well as education and ECG training may be ways to improve this interpretation.

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Risk of sudden cardiac death in hemodialysis patients

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Introduction and Aims: Sudden cardiac death (SCD) is the leading cause of death among chronic hemodialysis patients (CKD). The aim of our study was to determine in which degree the dialysis is implicated in arrhythmias development in CKD.

Methods: Continuous 24-hour Holter monitoring were carried out in 37 CKD and in a control group (C) composed by 32 patients with cardiovascular morbidity but without renal failure. We studied atrial and ventricular arrhythmia in several times: the dialysis session (HD), 4-hour post dialysis period (early-HD) and the next 16 hours (late-HD). Temporal parameter (Standard Deviation of the NN intervals SDNN) of heart rate variability was calculated from these recordings.

Results: The included patients had cardiovascular morbidity (HTA in 91.9 of CKD vs 100% of C, p=0.15; left ventricular hypertrophy in 73 vs 68.8%, p=0.4; diabetes in 37.8 vs 18.8%, p=0.07, hypercholesterolemia in 67.6 vs 75%, p=0.3). Ectopic atrial premature contractions were uniformly distributed in the different periods of the Holter (p=0.01, Spearman correlation). 13.5% of CKD (which 40% only during the HD, 20% during the HD and the late-HD, 20% during the early and the late-HD and 20% only during the late-HD) and 3.12% of C displayed atrial fibrillation (AF) (p=0.2). Ventricular premature contractions (VPC) were frequent (81% in CKD vs 77% in C, p=0.48). Ventricular tachycardia was observed in 5% of CKD (which 100% in the HD) vs 6% of C, p=0.64. Only CKD developed torsade de pointes (3% of CKD during the late-HD period). Polymorphic VPC were described in 32% of CKD and 3% of C, p=0.002. These polymorphic VPC were equally distributed in each period of the Holter (p=0.01, Spearman correlation). A fallen SDNN less than 80 msec was found in 54% of CKD vs 26% of C, p=0.036. There was not correlation between AF (p=0.64), ventricular arrhythmia (p=0.40) and low SDNN in our study.

Conclusions: CKD developed as many atrial and ventricular arrhythmia as high cardiovascular comorbidity C except for torsade de pointes and polymorphic VPC. This difference would be explained by uremic myocardial fibrosis. Dialysis could provoke arrhythmia because of fast hydro electrolyte shifts. Cardiac autonomic functions were significantly altered in CKD, which is related with an increased risk of sudden death.

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Comparison between flecainide and ajmaline challenge in Brugada syndrome patients

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Background: Flecainide (F) and ajmaline (A) challenges are used to unmask the aspect of Brugada syndrome. There is no direct comparison of these two drugs in the large population of patients.

Methods: Injections are performed by continuous infusion over a period of 10 minutes at 1mg/kg dose for A and 2 mg/kg for F.

Results: F was performed in 412 patients and A in 311.

Mean age was 41±16 years and 42 F±16 years in A (p=0.2) and there was 194 women in group F (47%) vs 152 in group A (48%), NS. All patients were in sinus rhythm in both groups. There was no difference between the two groups for heart rate 70±12 vs 71±13 bpm (p=0.17), PR 161±28 ms vs 162±29 ms (p=0.63), QRS 95±20 ms vs 96±13 ms (p=0.94). The QTc appears to be longer in the F than in the A group 409±29 vs 418±28 ms (p=0.001).

During the test, HR increase in both groups 74±12 vs 78±12 bpm but the increase was more pronounce in A (p<0.001). There was no difference for PR 190±33 ms vs 187±36 ms (p=0.4) and QRS 114±20 ms vs 115±23 ms (p=0.35). The QTc remains longer in the A than in the F group 451±33 vs 438±34 ms (p=0.001).

The number of positive tests F 123/412 (30%) vs 121/311 (39%) was slightly higher in A group even if this difference was not significant.

During the tests arrhythmic complications were rare (VPBs 5 vs 2 and VT 1 vs 3).

Conclusion: In this large population of patients, the results of Flecainide and Ajmaline challenge are similar for conduction parameters and risk of ventricular arrhythmias.