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Improving quality of care and financial burden in cardiology: a new approach with checklist based clinical pathways - first results
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Purpose: Clinical pathways (CP) have increasingly been introduced into surgery for thoracic aortic diseases. The aim of CPs is to enhance effectiveness and quality of care by guideline specific and standardized treatment and to subsequently reduce health care costs. Due to higher disease complexity and less standardized treatment approaches, cardiology and other specialties of internal medicine have so far only seen sporadic introduction of CPs.
Methods: In order to study feasibility of CP implementation into the clinical routine of a German university cardiology department, a novel checklist based CP system was broadly introduced. Key elements were 14 disease-specific CPs each detailing relevant diagnostic and therapeutic procedures and mandatory safety checks. Overall goal was to enhance standardization and cross-functional workflow and thereby quality of patient care. Aim of this study was to improve CP-implementation feasibility and to evaluate clinical burden measured in average length of hospital stay (ALOS). Results were measured after 12 months of CP use (> 4500 patients included) and compared to pre CP introduction.
Results: Evaluation of used CP documents showed high compliance levels for CP use among staff (CPs used in > 95% of patients) while surveys for all involved functions underlined usability. Following CP introduction no significant change in ALOS was found in “high-volume diseases” (n=380 to 780 per year) e.g., angina pectoris (LOS +2,0%; p=0,78), myocardial infarction (-3,0%; p=0,63) or heart failure (-0,1%; p=0,17), while there was significant LOS-reduction for AbP (-4,9%; p=0,01). Hypertensive urgency patients showed an increase in LOS (+16,9%; p=0,001) while “low-volume diseases” (n=29 to 150) revealed substantial LOS reductions (syncope: -23,1%; p<0,001; DVT: -20,8%; p=0,03; PE: -10,2%; p=0,07). Conclusion: We showed feasibility of successful CP introduction within internal medicine by developing a novel checklist based approach built on cross-functional treatment guidance, transparency and mandatory safety checks. Significant ALOS-reduction for less frequent diseases were shown, further standardization of high-volume diseases seems less promising. LOS increase after CP introduction in hypertensive urgency can most likely be attributed to enhanced diagnostic screening in patients with hypotension. Since long hospital stays are an increasingly relevant burden for patients, care providers and payers, a broad implementation of the introduced CP approach could be an important lever in lasting quality of care improvements within cardiology.

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Pre-diabetes is a disease associated with significant cardiac and cardio-vascular structural and functional abnormalities
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Purpose: To examine whether pre-diabetes is a risk factor for cardiac and cardiovascular structural and functional abnormalities (abn.), i.e. abn. small artery stiffness (C2) and abn. Carotid Intima Media Thickness (CIMT).
Methods: We screened 2336 asymptomatic subjects, age 20-80, for CVD risk using Early CVD Risk Score (EVCDSR). EVCDSR consists of 10 tests: C1 and C2, BP at rest and post mild exercise (PME), CIMT, abdominal aorta and left ventricle ultrasound, retinal photography, microalbuminuria, ECG, and pro-BNP. Euglycemia (EG), pre-diabetes (PD), and diabetes (DM) were defined according to the ADA criteria. Comorbidities (CM) were defined as elevated cholesterol, BP, waist circumference.
Results: Among the subjects screened, 73% (1642 of 2236) had EG, 27% (444 of 1642) of which had no CM, 22% (485 of 2236) had PD, 13% (63 of 485) of which had no CM, and 3% (74 of 2236) were diabetic, 3% (2 of 74) of which had no CM. 93% (450 of 485) of subjects with PD and 28% of the subjects with DM (21 of 74) were not taking antidiabetic medications. The presence of CVD abnormalities among the groups with EG and PD without CM is shown on table 1.
Conclusions: 1. PD is a disease associated with substantial greater structural and functional abnormalities than EG, particularly abn.C2. The relationship between increased glucose levels and abn. C2 holds even when controlling for CM. 2. The difference in the prevalence of abn. C2 between EG and PD subjects is statistically significant (p=0.0350).
3. PD is prevalent in the asymptomatic subjects (22%) screened.
4. The presence of abn. CIMT in PD subjects, as compared to EG subjects, is greater in males than females (4% difference). Whether this is due to the protective, hormonal effects in female or other factors may be subject for future studies.

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Genetic polymorphisms associated with the development of type 2 diabetes mellitus
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Type 2 diabetes mellitus (T2DM) constitutes a worldwide health problem associated with strong cardiovascular risk. There are environmental factors that contribute for the development of this disease, such as obesity or sedentary life. However, individuals with normal weight can have T2DM and, on the other hand, many of the obese individuals will not develop diabetes, suggesting that it is compelling. The evaluation of other variables, such as genetic factors.
Objective: Our study aims to investigate genetic polymorphisms associated with the T2DM onset in a Portuguese population.
Methods: We performed a case-control study with 1938 Caucasians which 548 were diabetic type 2 patients (classified as diabetic according to the European Association for the Study of Diabetes) and 1390 were controls, with no significant difference in age. Blood samples for genetic analysis were collected from both groups, in order to evaluate 18 genetic variants previously described as being associated with hypertension, obesity, diabetes or coronary disease as PON1 Q192R and PON1 L55M, KIF6 T1A, HNF4A G/C, APOE ε2, ε3, ε4). Data are presented by mean ± SD. Continuous variables are evaluated by Student t test and categorical variables by Chi Square tests. The power of the association was expressed by the Odds Ratio (OR) and 95% confidence intervals. Multivariable logistic regression is performed to determinate which polymorphic variants were significantly and independently associated with T2DM. A p-value less than 0.05 was considered statistically significant.
Results: The polymorphisms that showed association with T2DM, in the univariate analysis were: TCF7L2 TT (OR=1.69; p=0.0002) and ATIR CC (OR=1.58; p=0.021). After logistic regression, with all the genetic variants investigated and the environmental factors, only the TCF7L2 TT (OR=1.99; p<0.0001) remained in the equation showing to be significantly and independently associated with T2DM emergence.
Conclusions: This study suggests that there is in our population a genetic polymorphism that independently contributes to the development of T2DM. Since diabetes is associated with a very strong cardiovascular risk, the patients carrying this polymorphism should be approached with early preventive measures, in order to counteract their genetic tendency to develop diabetes.

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Insulin resistance is associated with similarly impaired LV myocardial deformation, untwisting and coronary flow reserve in first degree relatives and diabetic patients
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Insulin resistance is linked with endothelial dysfunction and arterial stiffness. In-