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Internal Medicine

Relationship between Physical Exercise and Major Depressive Disorder in patients with chronic renal failure: a meta-analysis

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INTRODUCTION

Chronic non-communicable diseases are responsible for about 60% of deaths worldwide, including Chronic Kidney Disease (CKD). In turn, CKD is a risk factor for the onset of Major Depressive Disorder (MDD). These disorders affect the quality of life of individuals who have it. In this context, physical exercise becomes an important ally in the treatment and reduction of MDD, in addition to bringing other benefits such as reduced body adiposity, decreased blood pressure and improved lipid profile of its practitioners.

AIM

To evaluate the relationship between physical activity and major depressive disorder in patients with chronic kidney disease.

METHODS

This study followed the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) and consists of a systematic review of the literature with meta-analysis.

RESULTS

A search was performed in 4 databases, Scielo, Pubmed, Embase and Scopus, where 51 clinical trials were found, excluding 7 duplicate articles, but only 3 were eligible for meta-analysis. All studies used the Beck Depression Inventory (BDI) to classify patients as mild, moderate and severe. The average in years of dialysis was 7.7 and 6.1 in the intervention group of 2 works. All patients who had severe, mild or moderate depression in the intervention group at the end of the studies did not present any degree of depression. Cycling was used as an intervention. The frequency of physical exercise was 3 times a week. None of the patients were using psychotropic or antidepressant agents. The meta- analysis showed benefits for reducing major depressive disorder [- 1.30 (–2.01, –0.59), $p < 0.0003$].

CONCLUSION

Physical exercise is an effective tool with intervention to reduce symptoms in patients with mild, moderate and severe depression associated with chronic kidney disease.

Thromboembolic complications in patients with acute myeloid leukemia

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INTRODUCTION

The risk of thromboembolic events (TE) in patients with hematologic malignancies was thought to be lower in comparison to solid tumors. Still, new research suggests it is similar or even higher in those with hematologic illnesses. Incidence of TE in patients with acute myeloid leukemia (AML) varies in different studies between 2 and 13%. Additionally, there is no clear data on predictive factors for TE, nor guides for thromboprophylaxis.

AIM

The aim of this study is to acquire data on the frequency of TE, therapy, localization, disease stage upon diagnosis and prognostic factors for their onset.

METHODS

This retrospective study will include 150 patients diagnosed and treated for AML in the Hematology Clinic at the Clinical Center of Serbia, diagnosed according to World Health Organization (WHO) recommendations.

RESULTS

Venous thromboembolism (VTE) developed in 18% (n=27) patients. Most frequently, it was the deep vein thrombosis (DVT) 17.33%, 16% of patients with central venous catheter (CVC) related thromboembolism, and 0.67% with pulmonary embolism (PE). Arterial thrombosis was not noted. Thrombosis usually occurred during the phase of administration of consolidation therapy (41.94%). Discrepancy between the groups with and without VTE was statistically relevant, concerning: gender ($p=0.009$), D-dimer ($p<0.001$) and lethal outcome ($p=0.002$). Patients with VTE lived longer in comparison with the group without VTE ($p=0.001$, SE= 0.482, 95% CI 3.056 – 4.944). The group of AML patients with thrombosis (median 10 months (0.5 – 46); SE=3.92, 95% CI 2.324 - 17.676) had a higher five-year survival rate than the one without (median 3 months (0 – 38); SE=0.533, 95% CI 1.955 – 4.045). After thrombosis, 24 patients were treated using anticoagulant therapy.

CONCLUSION

Our study showed a higher incidence of VTE then in previously published studies. Furthermore, our study showed that male patients in consolidation with a CVC and an initial high D-dimer should be considered for thromboprophylaxis.

Comparison of Vitamin D Level in Preterm and Term Infant–Mother Pairs

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INTRODUCTION

Medulloblastoma has poor outcome due also to adverse events caused by the treatment [1]. An improved anti-tumor strategy is needed to enhance patient survival rate. REST is a transcription factor overexpressed in medulloblastoma cells and it's associated with the formation of this brain tumor and the low survival rate, suggesting an oncogenic role [2][3].

AIM

Resveratrol is able to reduce REST expression and the transcription factor FOXO3 could be an intermediate, since FOXO binding sites are present in REST promoter and its activity can be modulated through acetylation status modification [4][5]. Based on this, the aims of this study were to confirm the resveratrol-induced REST reduction, understand the engagment of FOXO3 in this mechanism and verify if resveratrol can also modulate FOXO3 expression.

METHODS

DAOY cells were transfected with siRNA against FOXO3 for 48 hours to study the modulation of REST expression. Moreover, DAOY cells were treated with resveratrol, at three concentrations (100 micromolar, 200 micromolar and 400 micromolar) and at three timepoints (24 h, 48 h and 72 h), to evaluate the expression of both transcription factors.

RESULTS

Transfected cells demonstrated a significant decrease of FOXO3 protein levels. On the other hand, these cells demonstrated a substantial increase of REST expression. Furthermore, resveratrol-treated cells demonstrated a significant decrease of REST and FOXO3 protein levels in a dose-dependent manner, in two timepoints. In turn, these cells demonstrated a noteworthy decreased of REST mRNA levels in a dose-dependent manner, in all timepoints.

CONCLUSION

According to this study, resveratrol was able to significantly decrease FOXO3 and REST protein levels. It's important to study the role of resveratrol in FOXO3 transcription, to confirm that both transcription factors are downregulated at mRNA level. Future perspectives will also include studies to evaluate that FOXO3 could bind REST promoter and the consequent effect on its expression, and the role of REST in FOXO3 expression.

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Volatile exometabolome profiling of human renal cell carcinoma cell lines for biomarker discovery

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INTRODUCTION

Renal Cell Carcinoma (RCC) constitutes approximately 90–95% of all kidney neoplasms and is the second most lethal urological cancer. Current diagnostic techniques rely on imaging techniques and an invasive procedure (biopsy) is always required for histopathologic confirmation of malignancy. For these reasons, the identification of accurate biomarkers to develop faster, less invasive and more sophisticated diagnostic techniques is of utmost importance. Metabolomics has been widely applied in cancer biomarker discovery arising from the fact that cancer cells are metabolically reprogrammed to control the energy required by the rapid growth and development of the tumor, producing a specific "metabolic signature".

AIM

To evaluate the potential of volatile organic compounds (VOCs) and volatile carbonyl compounds (VCCs) to discriminate the exometabolome of RCC from non-tumoral cell lines, and two different histological subtypes (clear cell and papillary RCC) in both metastatic and non-metastatic stages.

METHODS

Headspace-solid phase microextraction/gas chromatography-mass spectrometry (HS-SPME/GC-MS)-based metabolomics was applied for the volatile profiling of culture medium of five different tumoral cell lines, namely three clear cell (769-P, 786-O and Caki-1) and two papillary RCC (Caki-2 and ACHN), and one non-tumoral cell line (HK-2).

RESULTS

Multivariate and univariate analysis unveiled a panel of metabolites responsible for the discrimination between each RCC cell line vs. non-tumoral cells, metastatic vs. non-metastatic and clear cell vs. papillary RCC cell lines, mostly belonging to alcohols, aldehydes, alkanes and ketones classes. Some metabolites were found similarly altered for all RCC cell lines compared

to the non-tumoral, while others unveiled specificity for each RCC cell line.

CONCLUSION

The volatile exometabolome signature of RCC cells can provide candidate biomarkers for the development of a volatile sensor-based approach for non-invasive diagnosis of RCC in urine.

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Retrospective analysis of the treatment outcome in children with brain tumors treated in Department of Pediatric Oncology and Hematology in Krakow, Poland from 2013 to 2019

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INTRODUCTION

The brain tumors are the second most common pediatric malignancy and comprise more than 20% of all neoplastic diseases in children under the age of 14. Moreover, they are known as those with the highest mortality in childhood.

AIM

The aim of the study was analysis of the treatment results in children with brain tumors who were treated in Department of Pediatric Oncology and Hematology in Krakow, Poland from 2013 to 2019.

METHODS

There were 105 children (56 girls and 49 boys) enrolled to the retrospective study. Patients treated only with neurosurgery were excluded. Median age at diagnosis was 7 years (range 1 month to 17 years). Glioma was diagnosed in 43 children (21 with low grade glioma (LGG) and 22 with high grade glioma (HGG)), medulloblastoma (MBL) in 21, ependymoma in 15, germinal tumors in 4, atypical rhabdoid theratoid tumor (ATRT) in 3, pineoblastoma in 3, embryonal tumors in 6, brain stem tumors without histopathological examination in 7 and other tumors in 3 patients. Neurosurgery was used in 92 patients (88%), chemotherapy in all children and radiotherapy in 66 (63%). Median observation time was 36 months (range 3 months-119 months).

RESULTS

Probabilities of 3-years overall survival (OS) in whole group, LGG, HGG, MBL and ependymoma were 0.7, 1.0, 0.43, 0.72 and 0.7 respectively, and the probabilities of 3-years event free survival (EFS) in those groups were 0.46, 0.63, 0.18, 0.57 and 0.52 respectively. Proportion of deaths from disease progression was 3/3 in patients with ATRT, 4/7 with brain stem tumors, 2/6 with embryonal tumors and 1/4 with germinal tumors. There was no death of disease in patients with pineoblastoma.

CONCLUSION

The poorest prognosis was observed children with ATRT, HGG and brain stem tumors, the best outcome was achieved in children with LGG and pineoblastoma. The results are similar as described in literature.

Identification of new biomarkers in gastric cancer – the role of the epitranscriptome.

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INTRODUCTION

Gastric cancer is the fifth most common and the third cause of death by cancer worldwide. Its incidence has been decreasing, but the prognosis remains poor due to the late diagnosis and lack of more efficient therapies.

For these motifs, it's important to identify new biomarkers of prognosis and therapy response, as well as new therapeutic targets.

mRNA chemical modifications, namely methylation of the adenines (m6A), alter mRNA expression and the respective proteins. This process is executed by the combined activity of enzymes called "readers" (identify the adenines), "writers" (methylate the adenines) and "erasers" (remove the methylation). The expression and function of these enzymes are still unknown in cancer.

AIM

The aim of this study was to determine if YTHDF3 was a biomarker in gastric cancer,

METHODS

through the evaluation of its expression by immunohistochemistry in a series of gastric carcinomas operated in Centro Hospitalar de S. João, with clinicopathological and treatment data.

RESULTS

The results revealed that 61% of the cases expressed this enzyme while 39% either didn't or had low expression. We identified a significant association between the expression of this protein and clinicopathological parameters: Laurèn and WHO classification, and perineural invasion. Low expression of YTHDF3 was more frequent in diffuse, papillary and poorly cohesive tumours, as well as in tumours with perineural invasion. In addition we identified an association between the YTHDF3 expression and the chemotherapy response, particularly in patients with tumours in stage III and IV. After stratification of the patients based on the administration of adjuvant chemotherapy, it became clear that the patients with high expression of YTHDF3 had a superior response to chemotherapy then those with low expression.

CONCLUSION

Thus, the results suggest that m6A modifications have an impact in the biological behavior of gastric cancer and that this enzyme may be useful at the clinical level.

Combination of local and systemic inflammatory markers to predict survival in testicular germ cell tumors.

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