During and Before the COVID-19 Pandemic, the Association between Inadequate Vitamin D Intake and Mortality in Elderly People

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Abstract

An important fat-soluble vitamin called vitamin D has been linked to COVID-19, chronic illnesses, and death. Essential fat-soluble vitamin D is involved in the metabolism of calcium and bones. Recent scientific investigations have demonstrated that its shortage is linked to chronic diseases such sarcopenia, hypertension, obesity, diabetes mellitus, metabolic syndrome, cancer, coronary artery disease (CAD), infectious diseases, autoimmune diseases, and other musculoskeletal issues. It should be noted that these are significant conditions in terms of morbidity and mortality. Additionally, it is predicted that one billion individuals globally suffer from vitamin D insufficiency, which is a pandemic [1,2].

Keywords: Death25 (OH) vitamin D; Coronavirus; Geriatric; Severe vitamin D deficiency

Introduction

Epilepsy could be a common nervous disorder during which around fifty million individuals expertise continual and unpredictable seizures [3]. medication treatments will facilitate manage seizures; but, over half all people report negative aspect effects and around a 3rd of people with encephalopathy are proof against all pharmaceutical therapies. Common medicine medicine (AEDs) like carbamazepine are shown to decrease fat-soluble vitamin levels. Thus, more investigation of treatments with fewer aspect effects is required.

Individuals with brain disease conjointly suffer from many comorbidities, with one study finding a co-occurrence with syndrome Spectrum Disorder (ASD) from four.7–47.4% betting on the kind of brain disease [4-6]. Additionally, folks with brain disease have the next rate of bone fractures than the overall population. These fractures area unit freelance of falls associated with seizures. a discount of bone mineral density is commonly related to an absence of calciferol. folks with brain disease usually area unit deficient in calciferol levels. Despite the clinical studies that people with brain disease have a discount in bone mineral density and have low levels of calciferol, solely many studies have examined these measurements in pre-clinical models of brain disease [7,8].

Mutations in PTEN square measure related to neurodevelopmental abnormalities like abnormalcy, intellectual incapacity, and encephalopathy. additionally, mutations in PTEN are involved in mediating activity comorbidities related to encephalopathy like ASD. The enzyme and tensin homolog (PTEN) sequence could be a negative regulator of the PI3K/Akt/mTOR pathway, and once deleted ends up in hyperactivation of the communication pathway. Hyperactivation of mTOR communication has been involved in encephalopathy caused by genetic mutations in elements of the pathway, as well as stem induration advanced (TSC) and PTEN, likewise as in nonheritable models of encephalopathy [9]. The current study used a neuron-specific Pten (NS-Pten KO) mouse model, within which the factor was deleted in an exceedingly set of neurons within the hippocampus, cortex, and neural structure. Previous add our research laboratory has shown deletion of PTEN during this mouse model ends up in associate epileptic constitution additionally to the event of autistic-like behaviors in adulthood, together with alterations in sociality and repetitive behavior. NS- Pten KO mice conjointly encompasses a vital reduction

in bone mineral density within the proximal leg bone outgrowth and midshaft compared to WT mice. Therefore, this model can enable U.S.A. to work out treatments that would reverse encephalopathy comorbidities like autistic-like behaviors and bone phenotypes [10].

Description

A single-center, retrospective study was conducted utilizing the hospital's database of patients 65 years of age and older who had vitamin D measurements between January 1, 2019, and December 31, 2021. From the date of the serum vitamin D analysis until the death date or 01.01.2022, all patients having vitamin D measurements (N = 1555) were monitored as a cohort. Age, gender, long-term illnesses, prognosis, the deceased's date of death, laboratory results, such as complete blood counts, liver/renal functions, and 25(OH) vitamin D levels, were all documented. The subjects were divided into three groups based on their 25(OH) vitamin D levels: the severe deficient group (10 ng/ml), the intermediate deficient group (10-19.9 ng/ml), and the control group (20 ng/ml).

Conclusion

Cardiovascular disease caused by atherosclerosis, once thought to be a concern in wealthy nations, is now widespread. Only 50% of instances of atherosclerosis today can be attributed to known risk factors, and many young or middle-aged people exhibit subclinical and asymptomatic atherosclerotic plaques. The understanding of how atherosclerosis develops is still lacking despite the identification of a variety of risk factors, including dyslipidemia, endothelial dysfunction, inflammation, immunological illness, malnutrition, and lifestyle

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choices. To better treat cardiovascular disease and understand how it interacts with related disorders like COVID-19, a deeper understanding of new risk factors for atherosclerosis and the creation of innovative atherogenesis models that encompass these components are urgently required.

Preclinical animal models are crucial to the study of atherosclerosis. The rabbit is a useful model for examining how different atherosclerosis risk factors combine because of its parallels to human lipoprotein metabolism. In preclinical animal models, HCD is a strong inducer of atherogenesis; nevertheless, it can be harmful when used for extended periods of time. In reaction to hyperlipidemia, injury to the artery wall speeds up the development of advanced lesions, assisting in overcoming the harmful consequences. However, the potential of such models is constrained by the non-reproducible/uneven atherosclerotic plaque development caused by the widely used classical injury techniques.

We have created an automated injury technique (JURY) that makes the creation of atherosclerotic lesions more consistent and uniform in order to standardise atherosclerotic rabbit models. Due to automated retraction, the JURY device accounts for anatomical variations in vessel diameter and maintains friction at a more constant level. JURY is connected to a computer, allowing for real-time recording and display of balloon pressure data as well as change of injury parameters. This method reduces undesirable effects like aortic aneurysms, which can be brought on by high pressure and/or repeated denudation steps, by inducing mild injury already at 1.2 bar and a single retraction. In contrast to manual injury, automation of the arterial wall injury results in full endothelium denudation and more uniform and repeatable atherosclerotic plaque formation. In fact, balloon pressure has a crucial role in determining the degree of vascular injury as well as the subsequent intimal hyperplasia and vasomotor reactions. Our method causes type II injury, which can cause damage throughout the entire intended area, allowing for a more thorough analysis and wider application of the model. Automated JURY-controlled injuries outperform traditional "blind" and manual pressure-adjusted denudation, according to comparisons with the other two methods.

The MRI analyses used in this study had a high sensitivity to distinguish between various injury scenarios. Diffusion tensor imaging is frequently used to assess tissue integrity because it can spot small changes sooner than traditional MRI imaging. FA's high sensitivity to changes in the microstructural makeup of the arterial tissue has already been demonstrated. It's possible that difficulties with segmentation are to blame for the high standard deviation seen in the study's SD group's thinner aortic walls. However, our data also imply that FA is a sensitive marker of arterial wall remodeling, providing fresh information about the reorganization of connective tissue during atherogenesis.

The JURY device's capabilities have not yet been fully utilized in this study, and based on the findings; more complex damage scenarios may be envisioned. In fact, intricate plaques and thrombi emerge as a result of recurrent denudation and/or more severe injury parameters; nevertheless, in this investigation, thrombi were not seen under the indicated injury settings. The JURY device is the first motorised catheter retraction system that we are aware of, and it excels at pressure maintenance. Standardization of the injury approach also reduces the requirement for experimental animals.

Acknowledgement

Conflict of Interest

None

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