Conclusions

The age-related tendency toward weakening indices of innate and adaptive immunity that was observed in older people became more pronounced in people of senile age and not long-livers. We regard the identified immunological features in centenarians as signs of successful immunoaging that help maintain their homeostasis, allowing them to reach such an advanced age in relative health.

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P0566

Cross-talk on the interplay between caloric restriction, intermittent fasting, and healthy aging

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Background-Aim

Aging, a complex biological process shaped by genetics, environment, and lifestyle, is a target for modulation through caloric restriction (CR) and intermittent fasting (IF). Understanding the molecular and cellular mechanisms linking fasting to aging is crucial for developing strategies to promote healthy aging and prevent age-related diseases. This review explores the molecular and cellular impact of CR and IF on aging, focusing on mechanisms related to cellular senescence, mitochondrial function, and inflammation. The research aims to comprehend these mechanisms, identify intervention targets to mitigate age-related decline, and contribute to evidence-based strategies for overall well-being enhancement.

Methods

A systematic search of research databases tackling the effect of CR and IF regimens on the human's aging process, including the molecular pathways.

Results

IF and CR enhance metabolic health by improving insulin sensitivity, reducing inflammation, and optimizing energy utilization—critical for mitigating age-related metabolic disorders. Fasting is linked to improved mitochondrial function, which is vital for cellular energy production and preventing age-related decline. Emerging research suggests potential benefits for cognitive health and neuroprotection, influencing factors associated with neurodegenerative diseases. IF, as observed during Ramadan, is associated with reduced pro-inflammatory cytokines, mitigating systemic inflammation—a hallmark of aging. Lastly, IF and CR modulate various signaling pathways related to stress resistance and cellular survival, unveiling intricate connections between dietary interventions and aging.

Conclusions

IF and CR influence cellular repair, metabolic health, longevity, mitochondrial function, cognitive well-being, and inflammatory processes. While many findings derive from preclinical studies, the potential translational implications for human health are substantial.

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P1291

Regulation of the brain acetylome by Sirtuin-2 and during ageing

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Background-Aim

Non-histone lysine acetylation (ACK) was recently recognised as a highly enriched PTM in the brain. ACK regulates the stability of important synaptic proteins such as the AMPA receptors. Sirtuin-2 (Sirt2) is a NAD-dependent enzyme, expressed highly in the brain and is associated with neurodegenerative diseases and ageing. Sirt2 knockout (-/-) mice exhibit impaired synaptic plasticity, including altered Long-term potentiation (LTP) and long-term depression (LTD), as well as significant impairments in spatial and contextual memory.

A limited number of Sirt2 substrates have been characterised, and the regulatory role of Sirt2 is poorly understood in the brain. Although, the role of ACK has been recognised in the physiology and pathology of ageing, mostly in relation to Sirtuin enzymes. However, few studies have investigated the changes in ACK during ageing.

Methods

First, we identified putative Sirt2 substrates through comparative acetylome analysis of eight Sirt2 knockout (KO) and wildtype (WT) mice brain tissues. Second a comparative analysis of ACK in old and young mouse brain tissue was performed to understand how ACK changes during ageing. These datasets were generated by the analysis of immuno-enriched acetylated peptides from tissue samples using affinity purification (AP-MS) and label-free quantification liquid-chromatography with tandem mass spectrometry (LC-MS/MS) and bioinformatics analysis.

Results

Using these strategies, we identified 2,054 unique ACK sites on 818 ACK proteins in a Sirt2 KO versus WT brain tissue dataset. 226 sites had significantly higher ACK levels in Sirt2-/- mice and represent putative Sirt2 substrate sites. For the acetylome analysis of aged mouse brain tissues 2,496 unique ACK sites on 1,091 different proteins were identified, 60 of which exhibited a significant change in ACK in aged brain tissues. We found that ACK increased in 24 sites and decreased in 36 sites.

Conclusions

Our data identify novel putative Sirt2 substrates in the brain and characterise changes in ACK during ageing. This work will advance the understanding of the role of ACK and Sirt2 in the brain and how they contribute to neurodegenerative and age-related diseases.

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P1301

Detection of MAPT polymorphisms and H1 haplotype in frontotemporal dementia (FTD) Greek patients

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Background-Aim

Introduction: Frontotemporal Dementia (FTD) may be either familial (30–50 %) or sporadic, and as common as Alzheimer's in people < 65 years old. Among the many genes involved in the disease, is the MAPT gene (microtubule-associated protein tau) which is transcribed into 3R/4R protein isoforms, depending on whether they contain 3 or 4 repeats of microtubule binding domains. MAPT gene mutations or disturbance of the normal 1:1 ratio of 3R/4R isoforms −and consequently the microtubule balance of nerve cells- leads to FTD.

Purpose: Development of methodology for detection MAPT DNA mutations in Greek FTD patients with DNA Sequencing and MLPA (Multiplex Ligation-dependent Probe Amplification), comparison of the results with NGS method of another collaborating laboratory abroad and evaluation of findings in FTD patients.

Methods

In 20 well-ascertained FTD patients, EDTA blood was collected after obtaining their informed consent. DNA isolation was performed with the High Pure PCR Template Kit (Roche). Specific primers were designed for DNA amplification and sequencing of the amplicons of 11 MAPT exons. Then cycle sequencing (Big Dye Terminator v3.1) and electrophoresis of the purified products in the SeqStudio genetic analyzer (Thermo ABI) was executed. Also, MLPA methodology was performed in all samples in order to detect large rearrangements of the MAPT gene (MRC Holland). Results were analyzed with bioinformatics software Chromas, NovoSNP and Coffalyzer.

Results

Agreement between the two laboratories was largely found. The same 5 benign polymorphisms were detected in 10/20 samples. Two of them are intronic (rs75242405, rs1800547) and three of them are synonymous exonic (rs1052551, rs1052553, rs17652121). Four of these five polymorphisms belong to the H1 haplotype.

Conclusions

The verification of the developed method for detection of MAPT alterations is considered satisfactory. In 50 % of the FTD patients, the MAPT H1 haplotype was detected. It has been correlated with increased expression of 4R isoforms that bind more tightly to microtubules. A further purpose is to analyze more Greek FTD patients, in order to investigate the role of the H1 haplotype in the development of subtypes of the disease (e.g. presentation with atypical Parkinsonian syndromes).

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P1317

Determination of reference range for sodium, potassium, calcium and chloride in elderly people

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Background-Aim

Increasing life expectancy is a global reality. Aging is accompanied by pathophysiological changes and health services need to be prepared to care for patients over 60 years of age. The objective of this work was to determine the reference intervals (RI) of the biochemical biomarkers Sodium, Potassium, Total Calcium and Chlorides in elderly people.

Methods

This is an analytical, quantitative, observational epidemiological study carried out with the results of laboratory measurements of elderly patients, over 60 years of age, of both sexes, classified as having low or moderate risk of clinical-functional vulnerability treated at the Geriatrics outpatient clinic. and Gerontology of a highly complex university hospital. To determine the IR, inclusion and exclusion criteria were applied following literature standards. The RI was determined using the 2.5 % and 97.5 % percentiles with 90 % CI. Statistical analyzes were performed as recommended by the CLSI C28-A3c guideline using GraphPad Prism® software.

Results

848 elderly people aged between 60 and 91 years participated in the study. By performing the Mann-Whitney test, it was possible to verify the significant difference between age and gender groups and determine the IR using the 2.5 % and 97.5 % percentiles with a 95 % CI. The RIs were: Total Calcium (mg/dL): Women and Men: 8.8–10.6. Chlorides (mmol/L): Women and Men: 97–107. Potassium (mmol/L): Women: 3.6–5.4 | Men: 3.7–5.6). Sodium (mmol/L): Women and Men: 137–148.

Conclusions

Specific reference ranges for electrolytes of clinical importance in the elderly were determined. The definition of these specific IRs is essential for safe clinical practice as they help in the interpretation of the most appropriate laboratory analyzes in view of changes in senescence.

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P1318

Determination of reference intervals for hemogram in elderly people

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