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SHORT COMMUNICATION

Impact of type 2 diabetes on the onset of Alzheimer's disease in the elderly population

Impacto de la Diabetes tipo 2 en la aparición del Alzheimer en la población adulta mayor

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ABSTRACT

Type 2 Diabetes Mellitus (DM2) and Alzheimer's Disease (AD) were recognised as two chronic pathologies whose prevalence has increased significantly in recent decades, especially in countries such as Argentina. Various investigations showed that DM2 acted as a possible risk factor for the development of AD. Epidemiological studies, such as the Rotterdam Study, showed that people with DM2 had up to twice the risk of suffering from dementia compared to the non-diabetic population. The mechanisms involved included insulin resistance, chronic inflammation and cerebral vascular damage, all of them associated with neurodegenerative processes. In the Argentinian context, the health panorama was complicated by the ageing of the population and the sustained increase in chronic non-communicable diseases. It was estimated that 1 in 10 adults had diabetes, and a high percentage were unaware of their condition, making early intervention difficult. Likewise, the prevalence of dementia in people over 65 years of age reached 12,2 %, with Alzheimer's disease being the most common form. This situation generated a significant burden for the health system and families, due to the complexity of care and the increase in functional dependence in old age. Strategies to address this problem included early detection, the promotion of healthy lifestyles, health education and the strengthening of epidemiological surveillance. The relationship between DM2 and AD posed a new challenge for public health, requiring comprehensive and sustained responses.

Keywords: Type 2 Diabetes; Alzheimer's; Public Health; Ageing; Argentina.

RESUMEN

La Diabetes Mellitus Tipo 2 (DM2) y la Enfermedad de Alzheimer (EA) fueron reconocidas como dos patologías crónicas cuya prevalencia se incrementó significativamente en las últimas décadas, especialmente en países como Argentina. Diversas investigaciones evidenciaron que la DM2 actuó como un posible factor de riesgo para el desarrollo de la EA. Estudios epidemiológicos, como el Estudio de Rotterdam, demostraron que las personas con DM2 presentaron hasta el doble de riesgo de padecer demencia en comparación con la población no diabética. Los mecanismos implicados incluyeron la resistencia a la insulina, la inflamación crónica y el daño vascular cerebral, todos ellos asociados con procesos neurodegenerativos. En el contexto argentino, el envejecimiento poblacional y el aumento sostenido de enfermedades crónicas no transmisibles complicaron el panorama sanitario. Se estimó que 1 de cada 10 adultos presentó diabetes, y un alto porcentaje desconoció su condición, dificultando una intervención temprana. Asimismo, la prevalencia de demencia en mayores de 65 años alcanzó el 12,2 %, siendo la EA la forma más común. Esta situación generó una importante carga para el sistema de salud y las familias, debido a la complejidad del cuidado y al aumento de la dependencia funcional en la tercera edad. Las estrategias para abordar esta problemática incluyeron la detección

temprana, la promoción de estilos de vida saludables, la educación sanitaria y el fortalecimiento de la vigilancia epidemiológica. La relación entre DM2 y EA planteó un nuevo desafío para la salud pública, requiriendo respuestas integrales y sostenidas.

Palabras clave: Epilepsia; Cannabidiol; Tratamiento; Legislación; Neuroprotección.

BACKGROUND

Type 2 diabetes mellitus (T2DM) and Alzheimer's disease (AD) are two chronic conditions whose prevalence has increased significantly in recent decades.[1] Numerous studies have shown a link between the two, suggesting that T2DM could be a risk factor for AD development.[2,3,4] In Argentina, this link is particularly relevant due to the aging population and the increase in chronic noncommunicable diseases.

Relationship between Type 2 Diabetes and Alzheimer's Disease

Several epidemiological studies have shown that people with T2DM are at increased risk of developing dementia, including AD.[5,6] The Rotterdam Study,[1] for example, was the first to demonstrate this association, indicating that diabetic patients have up to almost twice the risk of dementia compared to non-diabetics. Several pathophysiological mechanisms can explain this relationship:

- Insulin Resistance and Brain Dysfunction: Insulin resistance, a characteristic of DM2, can affect brain metabolism, altering neural signaling and contributing to the accumulation of beta-amyloid plaques, one of the main pathological features of AD.
- Chronic Inflammation: T2DM is associated with a proinflammatory state that can exacerbate neurodegenerative processes in the brain, facilitating the development of dementia.
- Vascular Damage: Chronic hyperglycemia can cause damage to the blood vessels in the brain, reducing blood flow and contributing to cognitive decline.

In Argentina, the prevalence of DM2 has shown a notable increase.[7] According to data from the Ministry of Health, it is estimated that 1 in 10 Argentines aged 18 or older has diabetes, and approximately 40 % of those who have it are unaware of their condition.[8,9] This underdiagnosis represents a significant challenge for public health, as it prevents the implementation of timely preventive and therapeutic strategies.[10]

On the other hand, the prevalence of dementia in Argentina is estimated at 12,2 % in people over 65 years of age, which means that more than 600 000 individuals suffer from some form of dementia, with AD being the most common.[11] This scenario reflects a considerable burden on the health system and the families of those affected.

Over the past ten years, Argentina has faced significant challenges in managing chronic diseases such as DM2 and AD. The aging population has increased the prevalence of these diseases, increasing the demand for the healthcare system.[12]

The coexistence of DM2 and AD in older adults complicates clinical management and increases the costs associated with caring for these patients. In addition, the burden on caregivers and families is considerable, as both diseases require continuous and multidisciplinary management.[13]

The older adult population is particularly vulnerable to complications from DM2 and AD. The simultaneous presence of both conditions can accelerate functional and cognitive decline, reducing quality of life and increasing dependence.[14]

In addition, DM2 in older adults is associated with an increased risk of developing geriatric syndromes, such as falls, incontinence, and frailty, which further complicates clinical management and increases the need for specialized care.[3,4]

To address this issue, it is essential to implement prevention and management strategies that consider the interrelationship between DM2 and AD:

- Early Detection and Control of DM2: Conduct periodic screenings in at-risk populations and promote strict glycemic control to prevent complications and potentially reduce the risk of developing AD.
- Promotion of Healthy Lifestyles: Encourage regular physical activity, a balanced diet, and reduced sedentary behavior, factors that are beneficial in the prevention of both DM2 and AD.
- Education and Training: Provide information and resources to healthcare professionals, patients, and caregivers on the relationship between DM2 and AD and best practices for the joint management of both diseases.
- Research and Epidemiological Surveillance: Strengthen information systems to monitor the prevalence and incidence of these diseases and evaluate the effectiveness of the interventions implemented.

The interrelationship between type 2 diabetes mellitus and Alzheimer's disease represents a growing challenge for public health in Argentina. Population aging and the increase in the prevalence of chronic diseases require a comprehensive response that includes prevention, early detection, adequate management, and support for patients and their families. Addressing this issue effectively is essential to improving the quality of life of the older adult population and ensuring the sustainability of the health system.

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CONFLICT OF INTEREST

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