Commentary

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Special Interest in Antidepressants as Potential Repurposing Drugs

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Description

Psychotropic medications known as antidepressants are used to treat mental illness with prominent emotional depression symptoms. It was reported that antidepressants had an effect against cancer, which was linked to changes in the microenvironment and a variety of signaling pathways. Cell apoptosis, antiproliferative effects, mitochondria-mediated oxidative stress, DNA damage, alteration of the immune system and inflammatory conditions, and inhibition of cancer cell multidrug resistance are some of its mechanisms. Numerous studies demonstrated that antidepressants had an effect on the metabolic pathway that tumor cells followed. Ten different types of antidepressants' effects and mechanisms in carcinostasis were summarized in this review of recent developments. Additionally, antidepressants are utilized in combination therapy with standard anti-tumor medications, demonstrating a synergistic effect in tumor treatment. In contrast, antidepressants' promotion roles in raising the risk of cancer recurrence, mortality, and morbidity are also included. It was necessary to complete additional clinical experiments and mechanism analyses. The underlying mechanisms of antidepressant-mediated anticarcinogenic effects may shed new light on how to treat and prevent cancer in the clinic.

Slowed Neurodegeneration Progression

Since the prevalence of Neurodegenerative Diseases (ND) is expected to rise as the population ages, new treatment options are needed right away. Currently, treatment only focuses on symptoms management or slowed neurodegeneration progression. Drug development or existing drugs can lead to the development of new treatment options. Drug repurposing is the final source, and it is very beneficial because the pharmacokinetics and dynamics are already known. Antidepressants as potential ND repurposing medications have recently received particular attention. There are a few reasons for this: 1) Human studies show that depression is linked to an increased risk of neurodegeneration; 2) depression is common in Alzheimer's Disease (AD) and Parkinson's Disease (PD); 3) human subjects treated with antidepressants have a delayed onset or slower progression of neurodegeneration; 4) epidemiological studies show that long-term antidepressant treatment is linked to a lower rate of AD; and 5) data from preclinical studies show that antidepressants have a beneficial effect on pathophysiological biomark However, despite the widespread use of antidepressants NDs, there is mixed evidence regarding their clinical benefits, and epidemiological, animal, and cell studies exhibit inconsistencies. As a result, it's critical to comprehend the underlying mechanisms by which antidepressants contribute to neurodegeneration. There is still little understanding of how antidepressants like tricyclic antidepressants, selective serotonin reuptake inhibitors, selective serotonin and noradrenaline reuptake inhibitors and monoamine oxidase inhibitors interact with the brain on a cellular level. Despite the fact that antidepressants also have a significant impact on immune cells, antidepressants have traditionally been studied primarily in relation to their effects on neurons. The central nervous system's microglia, immune cells that live in the tissues, are crucial to neurodevelopment, homeostasis, and CNS pathology. Microglia activation is the process by which microglia cells quickly respond to changes in the environment of the CNS and initiate and control inflammation in the CNS. A change in the expression of inflammatory proteins and a morphological shift are hallmarks of microglia activation. Even though activation of microglia is necessary to start and control the inflammatory response, prolonged activation can cause neurotoxicity, which causes more inflammation and worsens neurodegenerative processes. Recent evidence strongly suggests that microglia cells play a causal role in ND and numerous studies have demonstrated that patients with ND, including AD and PD, have activated microglia in their brain tissue. As a result, it is possible to identify microglia cells as potential therapeutic targets and the idea that microglia activation is crucial in the early stages of neurodegeneration.

Serotonin Reuptake Inhibitor Efficacy

Several mental health conditions, such as depression, anxiety, post-traumatic stress disorder, obsessive-compulsive disorder, and binge-eating disorders, are treated with antidepressants. Despite their widespread use in clinical practice, their benefits may be marginal and their efficacy appears to vary significantly from patient to patient. Antidepressants' long-term effectiveness is hard to prove in the real world, and clinical trials may have underestimated the risks they pose. In clinical practice, the choice of an antidepressant drug is based on a variety of factors, most notably the novelty of products

protected by patents, which may or may not reflect increased effectiveness. For instance, while direct comparisons of tricyclic and serotonin reuptake inhibitor efficacy did not differ in terms of patients' improvement or response, prescriptions of serotonin reuptake inhibitors increased while tricyclic prescriptions decreased in China from 2013 to 2018. Since older and newer antidepressants had similar effects, these shifts in market share could be caused by something other than efficacy. More than 50 million people were disabled as a result of depressive disorders in 2015, with more than 80 percent of this burden in low- and middle-income nations. The higher prevalence of mental illness in these settings may be explained by social factors like poverty, urbanization, internal migration, lifestyle changes, unemployment, armed conflicts, and cultural and institutional influences, despite the possibility that these estimates will go up because of the quality of the source databases. The poorest and most vulnerable people are at the highest risk of developing mental health disorders as a result of this vicious cycle, which also results in fewer opportunities that generate income and unemployment. Even though mental health issues may be more prevalent, there is less data available for drug use monitoring in these settings; Even administrative databases on drug use are opaque and inaccessible to the general public. A factor that contributes to an increase in mental suffering in Brazil is the rise in the number of people living in outlying areas that are not served by the government, are susceptible to urban violence, successive economic crises, precarious work conditions, and are exposed to hostile environments. In this nation, data on drug use come primarily from population-based surveys or are only available in subscribed databases, limiting access to and analysis of drug-related data. In order to assist the Brazilian National Surveillance Agency in monitoring prescriptions of medicines under special control from private drugstores and pharmacies, the Brazilian National Controlled Products Management System was established in 2007. Since 2014, the SNGPC's data have been made publicly available since 2020, making it possible to investigate drug use patterns in Brazil using an official and trustworthy source. These data may provide useful information about the use of particular medications and therapeutic groups, as well as changes in their market shares over time, especially for antidepressants. The purpose of this study was to examine the changes in antidepressant sales in Brazil between 2014 and 2020.