

RESEARCH
ROUNDUP

It's our goal here at *Good Health Lifestyles* to bring you the latest in cutting-edge research for a variety of common health issues. Because we believe that knowledge is power—especially when it comes to health—we are digging deeper into the exciting new research from leading medical journals and breaking it down to help you get the most from today's science.

Better Memory with Boswellia and Lemon Balm

THE STUDY ABSTRACT:

The effect of a tablet containing *Boswellia serrata* and *Melissa officinalis* extract on older adults' memory: A randomized, controlled trial.

BACKGROUND: Memory deficits and age-related memory loss are currently two significant concerns in older adults. In Iranian herbal medicine, there are some prescriptions for memory improvement.

OBJECTIVE: This study was designed to investigate the effect of a tablet containing *Boswellia serrata* (BS) extract and *Melissa officinalis* (MO) extract on memory of the older adults.

METHOD: This is a randomized, parallel, double-blind, placebo-controlled clinical trial that was performed among 70 older adults who referred to healthcare centers of Kashan University of Medical Sciences, Iran. Subjects were randomly assigned to receive either tablets ($n = 35$) or placebo ($n = 35$) for a month ($n = 30$). Data were collected using a demographic questionnaire and the Wechsler Memory Scale-Revised (WMS-R). Data were analyzed using Chi-square, independent-samples t-tests, paired t-test, repeated measures ANOVA, and ANCOVA using SPSS v13.

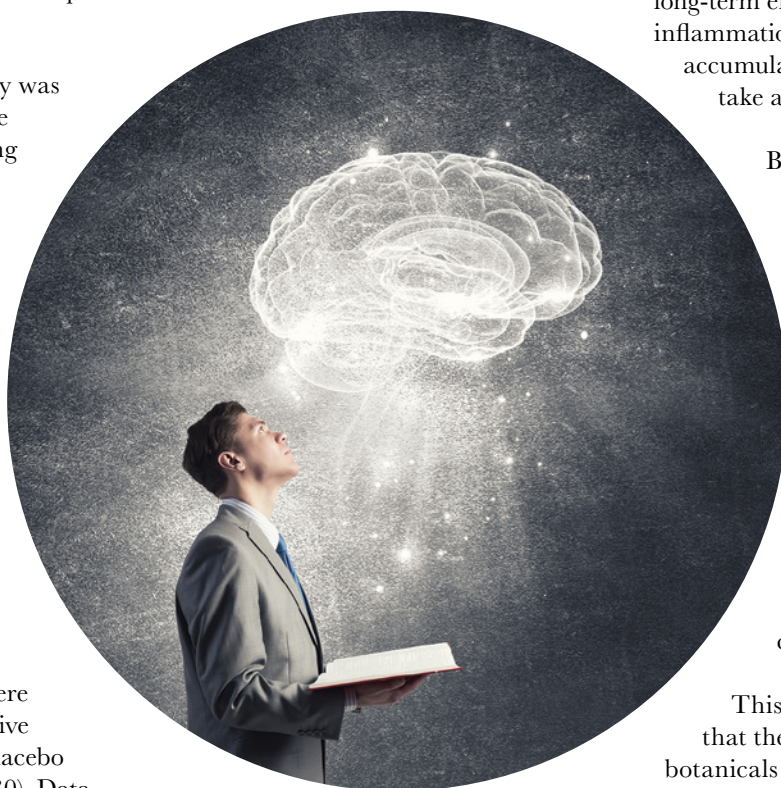
RESULT: Participants' baseline characteristics were similar in the two groups. The study was completed by 53 participants. However, as the analysis was based on an intention-to treat approach, all 70 older adults were included in the final analysis. Comparison of the two groups showed that the total scores of the WMS-R and the subscales, including auditory immediate, immediate memory, visual

on improvement of memory. This is still necessary to investigate effects and durability of the tablets on older adults with memory impairments in future studies.

Source: Taghizadeh M, Maghaminejad F, Aghajani M, Rahmani M, Mahboubi M. *Arch Gerontol Geriatr*. 2017 Dec 28;75:146-150.

WHAT IT MEANS TO YOU:

While cognitive decline is not necessarily related to aging *per se*, the long-term effect of oxidative stress, inflammation, and beta-amyloid accumulation in the brain can take a toll.



Boswellia and lemon balm (*Melissa officinalis*) are two traditionally used herbs that have also been widely researched as natural medicines. Boswellia is typically recommended to relieve muscle pain, intestinal inflammation, and respiratory conditions. Lemon balm is an excellent stress reliever and topical treatment for cold sores.

This 30-day study showed that the combination of both botanicals improved memory and memory-related test scores in older adults. While the researchers recognize that further studies are required, this clinical work shows the potential value of two powerful herbal medicines that may provide hope for older adults and their families to preserve independence and cognitive resilience.

immediate, and working memory, were increased after consumption of the containing BS and MO tablets ($p < 0.0001$).

CONCLUSION: The BS and MO tablet in older adults can be beneficial

Can Cannabidiol (CBD) Help Stop Brain Tumors?

THE STUDY ABSTRACT:

Reactive oxygen species-mediated therapeutic response and resistance in glioblastoma.

Glioblastoma (GBM) resistance to therapy is the most common cause of tumor recurrence, which is ultimately fatal in 90% of the patients 5 years after initial diagnosis. A sub-population of tumor cells with stem-like properties, glioma stem cells (GSCs), is specifically endowed to resist or adapt to the standard therapies, leading to therapeutic resistance. Several anticancer agents, collectively termed redox therapeutics, act by increasing intracellular levels of reactive oxygen species (ROS). In this study, we investigated mechanisms underlying GSC response and resistance to cannabidiol (CBD), a non-toxic, non-psychoactive cannabinoid and redox modulator. Using primary GSCs, we showed that CBD induced a robust increase in ROS, which led to the inhibition of cell survival, phosphorylated (p)-AKT, self-renewal and a significant increase in the survival of GSC-bearing mice. Inhibition of self-renewal was mediated by the activation of the p-p38 pathway and downregulation of key stem cell regulators SOX2, Id1, and p-STAT3. Following CBD treatment, a subset of GSC successfully adapted, leading to tumor regrowth. Microarray, TaqMan, and functional assays revealed that therapeutic resistance was mediated by enhanced expression of the antioxidant response system Xc catalytic subunit xCT (SLC7A11 (solute carrier family 7 (anionic amino-acid transporter light chain), member 11)) and ROS-dependent upregulation of mesenchymal (MES) markers with concomitant downregulation of proneural (PN) markers, also known as PN-MES transition. This 'reprogramming' of GSCs occurred in culture and in vivo and was partially due to activation of



the NFE2L2 (NRF2 (nuclear factor, erythroid 2-like)) transcriptional network. Using genetic knockdown and pharmacological inhibitors of SLC7A11, we demonstrated that combining CBD treatment with the inhibition of system Xc resulted in synergistic ROS increase leading to robust antitumor effects, that is, decreased GSC survival, self-renewal, and invasion. Our investigation provides novel mechanistic insights into the antitumor activity of redox therapeutics and suggests that combinatorial approaches using small molecule modulators of ROS offer therapeutic benefits in GBM.

Source: Singer E, Judkins J, Salomonis N, Matlaf L, Soteropoulos P, McAllister S, et al. *Cell Death Dis.* 2015 Jan 15;6:e1601.

WHAT IT MEANS TO YOU:

Glioblastoma is a difficult to treat form of brain tumor that generally strikes individuals between 60 to 80 years of age. While initial therapies against these tumors can seem positive, the survival of stem cells that lead to recurring cancers are a continuing challenge. Researchers found that cannabidiol (CBD), a non-psychoactive cannabinoid found prominently in hemp oil, strongly inhibited the spread of brain cancer cells. However, CBD seemed to work

even more effectively when combined with other small-molecule inhibitors of antioxidant response genes to prevent the body from unwittingly preserving the cancer stem cells.

Tumor formation of any kind presents an intensive challenge to conventional or leading-edge approaches alike. While the best possible option may be to include strong anti-inflammatory and antioxidant botanicals (like hemp oil) into a daily regimen over the long term, this research shows an increasing willingness to bring together traditional and modern therapies in ways that may provide powerful results in the future.

This kind of leading research also illustrates the complexity in trying to create oxidative stress in cancer cells without harm to the healthy tissue around it. Upcoming studies may help develop a two-part therapeutic approach that uses CBD as a primary weapon against glioblastoma, backed by secondary, conventional drugs or other treatments that effectively prevent it from recurring. And, given the popularity of hemp oil supplements, many people may already be starting a preemptive strike against tumors from forming in the first place. ■