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Diet Can Impact Development of Dementia

Health and scientific personnel have long stressed that we are what we eat. Diets rich in greens and low in simple sugars, saturated fats, processed and red meats were felt to promote long term health. Paul Agarwal , PhD of Rush University in Chicago and associates just that problem with respect to development of Alzheimer's dementia. Their research was published in the *Journal of Neurology*.

Agarwal and colleagues compiled data from the Rush Memory and Aging Project which is a study of older adults who agreed to an annual physical evaluation and to donating their brains for evaluation after their death. Their study looked at 581 senior citizens with a mean age of 84 years for their first dietary assessment and a mean age of 91 at the time of death. 73% of the participants were women with all patients followed for about 6.8 years. Prior to their deaths, 38.5 % of the participants were diagnosed with clinical dementia with 66% having a pathological diagnosis of Alzheimer's Disease at autopsy.

The authors studied how closely the participants followed a healthy Mediterranean Diet which recommends vegetables, fruits and three or more servings of fish per week or a MIND Diet which encourages green leafy vegetables, berries as opposed to fruit and one or more servings of fish a week. Both programs recommend a limited amount of wine.

The autopsies revealed that those individuals who had the most consumption of green leafy vegetables, seven or more servings per week, had less autopsy Alzheimer's pathology than those who ate only one or two servings per week. Those who ate more green leafy vegetables had less beta amyloid in their brains a compound associated with Alzheimer's Disease. There was no association with phosphorylation tau protein tangles.

The study showed that elderly individuals following either a Mediterranean Diet or MIND Diet exhibit a lower burden of Alzheimer's pathology at autopsy. It supports physicians, dietitians and public health officials encouraging healthy eating as a way to limit your risks of developing dementia.

Can Your Blood Type Make You More Susceptible to a Stroke?

The *Journal of Neurology* published a peer reviewed study that examined whether your blood type could contribute to your chance of having a stroke early in life. The studies looked at almost 17,000 patients in multiple locations including North America, Japan, Australia and Pakistan. From this group they reviewed 5,825 patients younger than age 60 who had an early onset stroke (EOS). It was part of the Genetics Early Onset Ischemic Stroke Project which looked at 48 distinct peer reviewed programs.

Their results showed that individuals with Blood Type A were 16% more likely to have an early onset ischemic stroke than those with other blood types. Patients with Blood Type O were found to have a 12% less chance of having an early onset ischemic stroke.

The reviewers were quick to point out that smoking, having uncontrolled elevated blood pressure, diabetes and elevated cholesterol were all far greater risk factors for having an early age ischemic stroke than a particular blood type. The authors were also quick to point out that they were not sure how the presence of a particular

blood type with any or all of these other risk factors contributed to your stroke risk. In an editorial that accompanied the article in *Neurology,* they discussed that upcoming research studies were needed that examined these questions.

We are moving in a diagnostic direction of being able to utilize genetic markers to help personalize individuals' care. In the past, when asked by a patient to randomly run a Blood Type for their own knowledge, I never really saw the need to perform the test. If you need a blood transfusion it will still be required to proceed with blood typing prior to the transfusion. However, with blood type being associated with multiple conditions maybe we should have this data at our fingertips just like we now look at blood sugar level, hemoglobin A 1C level , potassium level, etc.?

The study looked at Early Onset Ischemic Strokes with the blood type being a risk factor in younger victims. This is quite different than strokes in older senior citizens.

If I now find a 50-year-old hypertensive, overweight individual with Blood Type A do I start that person on a baby aspirin in addition to addressing his blood pressure and weight?

The answers to these questions will require further research.

Time To Screen For Lung Cancer

The United States Preventive Task Force (USPTF) for years has recommended that smokers and former smokers be screened annually with a low dose CT scan of the lungs. Despite this recommendation, experts believe less than 20% of the eligible patients are ever screened. In recent years they lowered the entry age and the number of cigarettes smoked to widen the surveillance. If you are 50 years old with a smoking history of at least 20 pack years (calculated as number of packs smoked per day x the number of years you smoked) you should be screened until age 80.

In a recent study published in the *Annals of Internal Medicine*, Iakovos Toumazis, PhD, of the University of Texas MD Anderson Cancer Center in Houston proposed an alternative risk model-based screening for lung cancer that may be much more cost effective and save more lives than the current USPTF recommendations. This model will be reviewed and may supplant current recommendations.

Leica Sequist, MD, MPH, and team at the Harvard Medical School and Massachusetts General Hospital of Boston have developed a screening tool using Artificial Intelligence with a program they developed named Sybil using one Chest CT scan. Their work was published in the *Journal of Clinical Oncology* and was able to look at pulmonary nodules and accurately predict which of those nodules, if any, had the ability to develop into a malignancy. Currently we follow these nodules with serial CT scans over a number of years to insure stability. One CT scan exposes you to the equivalent radiation of 200 chest x- rays so being able to scan only once and predict the future saves you from additional radiation exposure.

While the researchers and scientists perfect the art and skill of finding lung cancer early, we still need our patients who are 50 years old or older with a smoking history of 20 pack years or more to step up and identify themselves so we can get them screened safely. With the use of electronic health records and the high-volume patient loads seen in primary care offices daily, this information is not always obtained and or captured in the record.

Changes in Alcohol Consumptions & Dementia Risk

The coronavirus pandemic has been accompanied by an increase in the purchase and consumption of alcoholic beverages. A recent review of the medical literature being covered by the general media talks about even small amounts of alcohol being detrimental to brain health. To counter that opinion, an article appeared in this month *JAMA Network Neurology* section evaluating the effect of alcohol consumption over a prolonged period of time

and examining its effect on the likelihood of developing dementias including Alzheimer's disease, vascular dementia and other dementias.

The data was obtained in South Korea from their National Health Service data bank. Almost four million patients with a mean age of 55 were followed from 2009 until 2018. They were categorized into nondrinkers of alcohol, mild drinkers (< 15 grams per day) , moderate drinkers (15-29.9 g per day) or heavy drinkers (>30 grams per day). On the basis of the patients reported, alcohol consumption changes over that time period were reclassified into nondrinkers, quitters, reducers, sustainers and increasers.

Based on recent reports of even mild drinking causing brain damage, the results were surprising. Heavy drinking was associated with an increased risk of dementia as expected . Mild to moderate drinking was associated with a decreased risk of developing dementia compared to sustained nondrinking. Heavy drinkers who reduced their intake showed a diminished risk of dementia as did nondrinkers who began to drink lightly regularly.

This South Korean study seems to show that drinking alcohol in moderation doesn't increase your chances of developing dementia. Its unclear whether this data applies to the US population or is there something different in that culture that protects South Koreans compared to Americans? It certainly promotes the idea of drinking alcohol in moderation does not increase your chances of developing dementia.

The Value of PSA Testing for Prostate Cancer

The periodical *A Cancer Journal for Clinicians* reports that the incidence of prostate cancer has increased annually by 3% since 2014. In men of color, the incidence of prostate cancer is 70% higher than in Caucasian men and mortality rates are 2-4 times higher.

Despite this, the Unites States Preventive Task Force (USPTF) has been lobbying against screening for prostate cancer with a PSA exam especially in men 70 years of age and older. In the years 2012-2018, the USPTF advocated against screening for prostate cancer in all aged men despite European Urological Society data showing that the screening saved lives. After 2018, the USPTF changed its recommendations and stated that in men 55-69 you may test the PSA after engaging in "shared decision making" Shared decision making involves explaining to the patient before drawing their blood that there are multiple non-cancerous reasons for the PSA to be elevated including having sex recently and achieving an orgasm, prostate inflammation or infection and just healthy aging with the prostate enlarging over time.

If your PSA is elevated it leads to further testing which could include additional blood tests, urine tests, imaging studies such as an MRI of the prostate and ultimately a prostate biopsy. The biopsy can either be done under ultrasound guidance through the rectum by a urologist or under MRI guidance through the less infectious perineum usually performed by an interventional radiologist.

The USPTF believes that ordering a PSA blood test leads to worry and additional procedures that can produce infections, irritations anxiety and are costly. Chris Gillette, PhD of Wake Forest University School of Medicine and professor of Physician Assistant Studies, claims that despite the USPTF guidelines that for every 100 male patients over 70 years of age, physicians are still ordering the PSA on 6.7 patients and performing a digital rectal exam on 1.6 of them. He calls these tests low value.

I disagree. They are certainly not low value in men of color over 70 years old. They are not low value in men over 70 with a family history of prostate cancer. I am not sure they are low value in men over 70 who are fully educated on the pros and cons of the PSA test and are still asking for it to be performed. They understand the risks and if they still wish to proceed for their peace of mind how is that low value?

I would remind Professor Gillette that the digital rectal exam may be a poor tool for screening for prostate cancer, but it is certainly not a bad tool for checking for rectal sphincter tone, rectal masses, size of the prostate glands palpable. I do not believe performing a digital rectal exam adds much cost to the examination either.

If you are a man 40 years of age or older, I suggest you discuss the pros and cons of PSA testing with your physician before your checkup. If you decide to proceed with it, then it becomes mutually agreed upon shared decision making not low value.

Air Pollution & Loss of Smell Connection?

In recent years, medical researchers have explored the possibility that loss of smell is one of the early signs of developing dementia or cognitive dysfunction. Several recent research studies have evaluated whether air pollution is a major cause of loss of smell and possibly dementia. Our sense of smell is dependent on the olfactory bulbs which are nerve rich and sit on the underside of the brain.

Air pollution from the burning of carbon-based fuels produces microscopic particles known as small airborne pollution particles (PM2.5). These contaminants containing minute metal particles gain access to the brain through the olfactory bulbs and have been shown to result in producing plaque in the brain associated with dementia.

There are few studies looking at the quantity of PM2.5 particles in the air in a community and loss of smell. In 2006 a study performed in Mexico City, known for its poor air quality, revealed that its occupants smell was significantly worse than Mexicans of similar age living in less polluted rural areas.

When a large number of residents of Baltimore were discovered to have anosmia researchers investigated the quality of the air and its relationship to loss of smell. To evaluate this problem, research epidemiologist Zhenyu Zhang looked at air pollution levels in the Baltimore area using 2,690 patient records from visits to the Johns Hopkins Medical Center. The rate of loss of smell was noted to be significantly higher in patients who lived in the most polluted areas with the highest number of PM2.5 particles. The loss of smell in 20% of this patient population was much higher than expected when they matched it against similar age groups with similar body types and similar smoking history. Yes smoking leads to an increased risk of loss of smell as well.

In a study in Northern Italy, the smell of teenagers was put to the test. Those that lived in neighborhoods with high levels of nitrogen dioxide had a less sensitive sense of smells. Nitrogen dioxide is a product of the burning of fossil fuels.

Burning fossil fuels can also produce particles far smaller than PM2.5 particles which enter the brain through the olfactory bulb. A study in Britain looking at autopsies in patients from highly air polluted communities found minute metal particles in the brains of patients. According to some studies, air pollution contributes to 25% of all heart and lung related deaths in addition to its known relationship to stroke.

The World Health Organization (“WHO”) recognized the effect of air pollution, loss of smell and increased risk of death and lowered its acceptable rate of PM2.5 particles from 10 to 5 micrograms per cubic meter. The hope is that with less pollution there will be less loss of smell and less loss of life. The WHO’s efforts have been hampered by global warming, multiple major worldwide wildfires and, for economic reasons, a slow conversion from fossil fuels to more environmentally friendly methods of producing energy.

With anosmia (loss of smell) now being associated with dementia, heart, lung and cerebrovascular disease, plus increased risks of depression and anxiety, it may be time to rethink our economic priorities.