

Epidemiological Evidence of Vitamin C and Cancer Prevention

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ABSTRACT: *There is strong epidemiological evidence that vitamin C has a beneficial effect on hormonal-related cancers. For 46 these trials, 33 observed statistically significant safety and with high intakes, the protectiveness impact is about two times higher compared to low intakes, in that a dietary vitamin C index was measured. 21 found significant safety in additional studies which measured the intake of fruit. The antioxidant effect of vitamin C or any of its fruit elements is clear and reliable data and pancreas. There are also good evidence for tumours of the uterus, rectum, breast and cervix. Some previous research on lung cancer have found important beneficial benefits of vitamin C. nutrient function studies in the condition are hampered by at least three error sources) in classifying individuals as nutrient intake), perception errors resulting from a negative and positive correlation between nutrient and other nutrient studies within communities with very homogeneous intakes with nutrients. Ascorbic acid, carotenoids, and other fruit and vegetable influences are known to function together. Improved fruit and vegetable intake should be promoted in general.*

KEYWORDS: *Ascorbic Acid, Cancer, Epidemiologic Studies, Epithelial Cancers, Vitamin C*

INTRODUCTION

Ascorbic acid is increasingly known as a broad-based biological agent. Well-established characteristics include hormonal and neurotransmitter synthesis, P-450 cytochrome activity and exogenous detoxification. The synthesis of the carnitine and its metabolism and its well-known antioxidant mechanisms are protective against cancer, coronary artery disease, arthritis, and ageing[1], [2]. Many pathways have been identified in depth elsewhere for ascorbic acid activity in cancer prevention. In free radical scavenging and defence against lipid peroxidation it plays a significant and maybe even dominant role. The active forms of vitamin E appear to be spared or reconstituted and other essential antioxidant components are spared. Various immune system functions of Vitamin C have been identified, including enhanced chemotaxis for the leukocyte, interferon output enhancement [3], [4]. It may be necessary to inhibit the spread of tumours and micro metastases in the synthesis of collagen and the integrity of the basement membrane and hyaluronidase inhibition. It is important to consider many points of possible misinterpretation before evaluating epidemiological data that exists refer to ascorbic acid and cancer prevention[5], [6]. They were addressed elsewhere in some depth. Briefly, nutrient function studies in the condition are hampered by at least three error sources) in classifying individuals as nutrient intake), perception errors resulting from a negative and positive correlation between nutrient and other nutrient studies within communities with very homogeneous intakes with nutrients. Misclassification errors cause a reduction of the risks measured to the null, making the reported risk calculation lower than it really is and rendering statistical inference more complicated[7], [8]. Studies which however have an impact in the face of a nutritional or biochemical misclassification generally have an even higher result if the true long-term dietary or biochemical status is established[9], [10]. The determined nutrient represents the investigator's desires and conclusions and does not actually reflect the actual causal force. Additionally the researchers have observed the combined effects of a reduced intake of two or more nutrients concurrently in biological processes, perhaps not working independently but most frequently together. Finally, experiments of homogeneous populations can yield difficult to interpret negative findings. Anyone in the world, for instance, may have a very limited consumption of a nutrient, controls as well as cases in experiments of extremely hazardous environments. Many of these are underlined below in esophagus cancer, although the issue may be more severe. The same condition may arise in the contrary; where the results of low levels are not well-established in a research group with respect to a nutrient.

1. Cancer Site Epidemiologic Studies

The following findings was confined to human-that is, case-control and prospective study in epidemiological research. There are no international association studies and no studies which merely aim to relate the intake of nutrients in a country to population or morbidity in a field. The following experiments are all individual: people with and without cancer are described and food consumption is measured in these same people. Such

experiments typically yield relative risk projections (sometimes referred to as a chance or likelihood ratios, often abbreviated RR or OR). RR or projections. The risk in the population exposed to a risk factor (low intake or foods rich in vitamin C here) is expressed as a proportion of non-exposed individuals (here, high intake). For simplification, all risks in this direction were presented, in order for a relative risk > 1.0 to mean a higher risk of the cancer for small intakes. For e.g., the relative risk (RR) = 2.0 suggests that the risk of vitamin C of low intakes is estimated to be twice that of high-in taking cancer. The experiments mentioned below are whether they reported or predict a real C vitamin value or whether they reported fruit, often tomatoes or raw vegetables in a diet rich in C vitamin. Studies on green vegetables that have actually been recorded are not known, even if they can contain vitamin C. A carotenoid content usually does not require a protective effect to be easily attributed to vitamin C.

2. Non-Hormone Dependent Cancers

2.1. Cancers of the Oral Cavity, Larynx, or Esophagus

The function of dietary factors was explored in seven case-control trials, most of which were detailed and well-controlled. All except one have found essential precautions to improve the intake or absorption of vitamin C. Most experiments involved smoking control and drug regulation. Studies also observed a risk ratio of 1.7 (men) or 2.0 (women's) to those in the lowest vitamin C quartile intake. Studies find that people who record fruit consumption once or less a week are 7 times more likely than those who consume it seven days a week. Two experiments have also demonstrated defence against carotene vegetables, while these products have been poorer or irrelevant in the others. The function of vitamin C or fruit has been evaluated by two studies of laryngeal cancer. Using a sample from the Roswell Park questionnaire, the study studied 374 larynx cancer and hospital monitoring cases. A poor consumption of vitamin C was associated with a risk ratio of 2.4 ($P < .005$) after consideration of the potential uncertainty caused by alcohol consumption and smoking. In contrast to at least once a week, the researchers found a statistically significant increase of 2.0 risk relative to fruit intake. Consumption of vegetables was also a significant factor. Several studies have studied the cancer of the oesophagus and most found clear and clinically important associations with the consumption of vitamin C or fruit. All four analysing the vitamin C index find statistically important relative risks of 2.0 after alcohol and smoking change. Researcher observed that the bottom third of the vitamin C population had a statistically important two-time risk ratio relative to those at the top third of the population. Fibres were also significantly defensive but not carotenoids. The only food that was considerably safe were fruits, particularly citrus fruits and juices. In a large case-control trial in a high-risk area of France, researchers researched esophageal cancer. A statistically important antioxidant effect on citrus fruit and vitamin C has been observed. Light-kids had a risk ratio of 2.6 after change to age smoking along with high vitamin C consumers. And smoking beer. Carotene had a significant but somewhat weaker influence as well. A questionnaire was used by the researcher to study the function of diets among 120 black men who died of oesophageal cancer and 250 others who died of other causes. Vitamin C was the only component in the lower one-third range with a statistically meaningful frequency increase, $RR=1.8$ after ethanol intake modification. Eventually, researchers observed a 2.4 ($P=0.004$) risk factor for low vs. high vitamin C intake even after smoking and alcohol modification. In the cases of oesophageal cancer, four studies have found apple or citrus fruits lower. For 105 cases of esophageal cancer and hospital management, the researcher explored the function of diet. The issues of fruit and vegetables were just three items green vegetables, carrots and new fruits. All was safe, but only the fruit intake was high ($RR=3.3$) and statistically relevant (trend $P < 0.001$) after accounting for the alcohol, smoking, and other influences. In an extremely esophageal region of the occurrence of cancer, the study has researched 354 esophageal and population management patients. Fresh fruits and vegetables consumption have been strongly linked to the risk of esophageal cancer. The most effectively defensive food including heavy intake of oranges. In a case-control study of esophageal cancer in Japan the investigator observed a risk ratio of 2.7 for less than normal fruit intake. The study found a slightly less apple and green salad consumption in 52 patients with esophagus cancer and hospital control subjects in Minnesota, but did not mention vitamin C indexes.

2.2. Lung Cancer

The most important epidemiological research investigating the link between dietary influences and pulmonary cancer is vitamin A or carotenoids. This focus also contributed to a failure to correct the food list for the diet questionnaire to better measure vitamin C and to an incorrect conclusion from the researchers about the function of vitamin C. Nevertheless, several authorities have examined the function of vitamin C, as are listed below, and studies in which it is possible to analyse independently the function of vitamin C-rich foods. Researcher examined 1253 lung cancer cases and 1274 age-. In the area of New Orleans, age, and race-

matched power. Around 31% of the sample population were black and 26% were non-smokers or ex-smokers who quit 3 y. Smoking, wages and other confounders have been balanced for results. The prevalence level was 1.5 ($P < 0.001$) for those who consumed 140 mg or more of vitamin C daily (as measured in the questionnaire). After adjustment to the intake of carotene, the vitamin C effect was improved (RR 1.9), while the researcher defines vanished after adjustment for the intake of vitamin C. Researcher researched 88 people with lung cancer and 137 controls for Hong Kong individuals who never smoked to explore risk factors. Gender, age, and income weighted risk figures. The reduction in the risk of lung cancer was found to be strongly associated only with fresh fruit and fresh fish intake. In the defensive direction, leafy green vegetables and carrots were but negligible. Those who consume fresh fruits less than once a week, in comparison to those who eat it five to seven days a week, have a frequency ratio of 2.4 (trend $P < 0.002$). In the Dutch report, 49 patients with lung cancer were tested by the physician at a case-control analysis. The risk rate was 2.1 (trend $P < 0.015$); the result was highest for adenocarcinoma, although the amount of squamous cell cancers in these women could have been too low for a reliable chance estimate. The risk of people with a C level of < 50 mg / d (as measured by the questionnaire) was 4.3 times greater than those with a higher dose, after changes to smoking and other risk factors. This was an extremely statistically significant result. There has been no influence of a 3-carotene ranking.

2.3. Pancreatic Cancer

Five research investigated either a vitamin C level or fruit risk for pancreatic cancer. Investigators in Louisiana studied 363 cases and compared the topics under patient supervision. The study was designed to determine a wide range of nutrients and inquire about the normal diet of adults. For those with less than 70 mg vitamin C / d (as measured in the questionnaire), 2.6 or 1:8 for men was comparatively dangerous compared with those with 159 mg / d (both $P < 0.05$). The usage of fruits was 1.6-fold defensive after correction for several conflicting factors (Base on the level of consumptions of six fruits, three of which are high in vitamin C). Investigators observed a highly important beneficial effect on both carrots as well as for citrus fruit in a case-use trial in Sweden with 99 patients and associated hospital and population monitoring participants. There was a double to triple preventive benefit for citrus fruits in contrast to someone that eat them less than a fortnight. 490 patients with pancreas and associated community searches were observed. The researchers The statistically important high risk for those who eat fresh fruit or vegetables fewer than five days a week is $RR = 1.4$ relative to those who ate them more often. The dietary instrument only included very broad categories of food, and in this case the single most important one was "fresh fruit or raw vegetables," which is surprising in terms of the simple crudeness of the device. Eventually, 201 people with pancreatic cancer as well as patient and community monitoring samples were examined. The daily intake of raw fruits and vegetable was very beneficial and the $RR = 1.8$ was corrected for many conflicting factors as compared with the intake of raw fruits and vegetables five or greater days a week ($P < 0.02$).

2.4. Stomach Cancer

Various ecological experiments have been conducted which have shown that fruit or vitamin C consumption in stomach cancer has a protective function. Within the gastric juice of people with normal gastric histology but not in pathological gastritis, ascorbic acid is recently shown to be elevated at three times the level of plasmatism. Therefore, ascorbic acid is the material needed for the anti-intrastation reaction in normal individuals predominantly in its reduced form; dehydroascorbic acid, on the other hand, in gastritis patients, is primarily in the oxidized type. For gastric tissue, ascorbic acid, which sometimes sinks to "unmeasurable levels" in chronic gastritis patients, is similar. It is worth noting, however, that the vitamin C intake indices were previously undifferentiated between ascorbic and dehydroascorbic acid, or called the conversion from ascorbic to decarbonise acid in cooking, and that the association between vitamin C and gastric ascorbic acid was only weak, but only $r = 0.22$. The following analysis is present in the person level. A statistically important preventive effect on gastric cancer of vitamin C or fruit has been observed in many trials. Investigators found that vitamin C was "the most esteemed dietary component between the whole population and management of case stomach cancer cases." The association was particularly powerful for diffuse and intestinal carcinomas. The statistical odds of inadequate intake of vitamin C is 1.8 for the composite group of diffusion and intestinal carcinomas. In Denmark, both males and female have reported a statistically important differential and a similar trend has also been observed in Minnesota. No vitamin A effect on stomach cancer was found. The author reports that "data regarding stomach cancer are compatible with an elevated risk associated with a typical shortcoming impacting a population minority."

2.5. Cervical Cancer

The researchers have investigated the role of ascorbic acid in precancerous illness, cervical dysplasia. For women with a precursor lesion, plasma ascorbic acid levels amount to 0.36 mg / dL and in controls to 0.75 mg / dL ($P < 0.0001$), even after adjusting for causes such as several spouses, many births, early puberty of the pregnancy and socioeconomic status. In a separate case-control sequence of 87 women with cervical dysplasia and related subjects dietary factors have also been investigated. The median excess risk for extreme dysplasia or carcinoma in location was large in contrast to those over 88 mg / d mean consumption ($RR = 4.35$). Also after regulation of age and sexual activity, vitamin C consumption was still a significant factor. Those who earned vitamin C in the lowest quarter were considerably higher in risk ($RR = 2.5$). Although eight sexual activity and nutritional factors like carotene had been monitored, the risk rate was still '2.0,' even though it was no longer statistically relevant. In comparison, after regulation of vitamin C and other factors, carotene was no longer safe. The fruit consumption was slightly defensive more than once a day ($RR = 2.5$). The safety for Plasma 13-carotene was considerable, ascorbic acid plasma was not tested. Invasive cervical cancer and population controls were investigated by the researchers 189 people. A statistically important double benefit was associated with reduced vitamin C intake. The fruit drinks showed a greater effect ($OR = 3, P < 0.01$). The result was comparable in size, but small, with carotene and dark green vegetables.

3. Hormone- Dependent and other Nonepithelial Cancers

3.1. Childhood Brain Tumours

Just one study on dietary factors for this cancer was done. In the experiment with the mothers' diets during breastfeeding, Thomas Sinks and John R Wilkins III interviewed parents of 100 children with brain tumours and 200 equivalent control items. A statistically important triple chance of developing brain-tumours for children during breastfeeding, an impact that persisted after a change to other component, was correlated with low maternal intake of vitamin C.

3.2. Breast, Endometrium, Ovary and Prostate Cancer

The lack of data for ovarian, endometrial and prostate cancer is not significant, but recent analyses indicate that vitamin C plays an important role in breast cancer. 85 women with ovarian cancer and population control subjects were examined by the researchers. Of those in the lower one third of the distribution ($OR = 1.4$) there is an impact in the defensive direction. However, statistical value was not reached. Two ovary cancer trials in Italy have been documented by scientists. Both have a statistically important protective effect for higher intake, often of two vegetable items, but no impact of a single item's recorded intake, fruit. Researchers also found no association in a study in China between Vitamin C consumption and ovarian cancer, although the lowest quartile was 68 mg. Ultimately, the vitamin C effect, as estimated from the 1957 study by Roswell Park, was not detected, but a vitamin A benefit from fruit and vegetables was determined. The current findings however do not suggest that vitamin C is essential for ovarian cancer. Two of these trials were observed, however, in populations with a very high consumption: in the low consumption class vitamin C < 98 mg / d and 12 portions of fruit a week combined in the trial sample.

CONCLUSION

46 tests have directly reported on a vitamin C index and plasma-ascorbate values in the above-mentioned no hormone-dependent cancer sites; 33 of these have observed statistically important protective effects and some have been in the protective direction but are not important. With rising intake none considered high risk. 29 studies have also shown substantial safety associated with repeated consumption and high risk associated with low consumption for the consequences of fruit intake. Research is exceptionally good for gastrointestinal, esophageal, gastric, and pancreatic cancer, with nearly all trials having a substantial protective impact. The evidence for cervical and rectal cancer are still very strong; only a few reports lack sufficient safety. Five new trials have shown statistically significant safety in lung cancer, although some older tests have seen no results. The security impact in the meta-analysis is evidently strongly consistent in breast cancer. Few trials have, however, found some statistically important beneficial benefit for vitamin C in ovarian or prostate cancer.

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