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THE ROLE OF DIETS IN PROSTATE CANCER DEVELOPMENT USING CUTTING –EDGE TECHNOLOGIES

Pathology

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ABSTRACT

The dietary nutritional components serve with the supply of indispensable nutrient in food that is compulsive to assist human life and death. The inauspicious effect of the some specific dietary components has been studied which contribute in cancer progression, whereas, there are dietary components which reduces the risk of cancer. In this paper, we resume our view of the current state of knowledge on diet and cancer. We focused on the most systematically noticed dietary connections for prostate cancer progression.

KEYWORDS

Prostate cancer progression, Lethal prostate cancer, Diet, Lifestyle

I. INTRODUCTION

The consideration of fortitude and impuissance's of the case –control investigation, companion, are essential while describing and interpreting outcomes for cancer and nutrition. Every individual has their own dietary intake and duration of intake in their life time. There are few compounds isolated from cancerous cells and the animal models in the laboratory might play a role as carcinogenic .Yet with the exceptions, there is no full proof data of trial on the human population trial that proof the direct role of the dietary component in the cancer progression or protection. The outcomes of comparative epidemiologic investigation among the cancerous and non cancerous individuals, the difference in their dietary component intake were observed. The validated elaborated food recurrence questionnaires render a prudent reflection of long-term dietary practices [1-3]. In Us and other countries, a leading cause of the mortality is PCa (prostate cancer). There are dietary components that show a promising in reducing risk and progression of PCa like Low carbohydrate intake, soy protein, ω3 fat, green teas, tomatoes and tomato products and the herbal mixture-zyflamend, whereas, in contradiction, there is nutrition like high intake of animal fat and higher β-carotene condition might accelerate the PCa risk [4]. The vitamins like vitamin C, D, E acts as antioxidant adjuvants and having an apoptotic, anti-angiogenesis, inhibitory action against cancerous cell metastasis potential [5].

A heterogeneous nature of the prostate cancer with lethal and indolent phenotype, the recurrence progression of this disease (PSA (prostate-specific antigen rise) is observed after therapy like radical prostatectomy or ration therapy. Still, after diagnosis of this disease individual were seen to live for several years, but it is of interest of public health to key out the all possible path to reduce their chance of progression of this disease [6]. Following a good life style, nutritional diet and a regular physical activity might play a significant role in prostate cancer prevention [7-8].

In worldwide in 2012 , the prostate cancer occurrence, mortality and prevalence were estimated as , it is the secondary most prevailing cancer observed in men and fifth leading reason of death from cancer in men(6.6% of the total men deaths). In 2012, the estimated death found to be approximately 307,000 and nearly 1.1 million men worldwide investigated with prostate cancer. The cases of the prostate cancer occurring were reported 70% in more developing regions. The accessibility of the biopsy and PSA (prostate specific antigen) testing practice made easier the detection of this disease widespread , and the rates are found to be highest in Australia, New Zealand, Northern America, Caribbean, Southern Africa and South America and in Western and Northern Europe. Incidence rates are found relatively low in Asian populations with approximated rates of 10.5 and 4.5 in Eastern and South-Central Asia. Mortality rates are ordinarily high in predominantly black populations (Caribbean, 29 per 100,000 and sub-Saharan Africa, ASRs 19-24 per 100,000), very low in Asia (2.9 per 100,000 in South-Central Asia for example) and intermediate in the Americas and Oceania [9].

In this review article we summarize the relationship among diet and lifestyle risk factors and aggressive prostate cancer at diagnosis.

I.A. Life style factors

1. Physical activity: The study manifest that the risk of the Prostate cancer is higher in those individual who not physically active compare to the active individuals are. This physical activity are measured with a metabolic equivalent task (MET), the value of the activity must be higher than six and are like jogging, biking, swimming, bicycling. The activities that increases sweating and accelerate the higher heart and respiratory rate are defined as vigorous activity. The study conducted by HPFS(Health Professionals Follow-up Study) on two thousand seven hundred five men suggest that ,men who perform vigorous activity three or more hours /week had decreased risk (61%) of dying from PCa that with men who perform vigorous activity one or to a lesser extent than one hour activity per week [10] .

Similarly , study conducted by CaPSURE (Cancer of the Prostate Strategic Urologic Research Endeavor)suggest that men at a brisk space walked 3 or more hours per week had PSA rise lower i.e prostate cancer recurrence, correlate to those men who walked lesser than 3 hours per week at an easy pace [11]. In the prostate progression, the accurate mechanism of vigorous activity is still under study, but meanwhile, several trials shows that vigorous activity and weight training ameliorate heart-lung function, anxiety, depression, fatigue, muscular strength, and complete life quality in prostate cancer suffering men [12].

2. Smoking and drinking alcohol: The adverse effects of the drinking alcohol and smoking on human's health are well known. Studies suggest that smoking accelerate the risk of combative prostate cancer and prostate cancer-specific fatality, and biochemical recurrence, progression of prostate cancer, metastasis, hormone-refractory prostate cancer [13-14].

I.B. Scientists have studied many additives, nutrients, and other dietary components for possible associations with cancer risk. These include:

1. Protein: Dietary factor

a) Eggs /choline: Consumption of eggs is found to be linked with progression of the cancer. According to study conducted by HPFS, elaborates the risk of prostate cancer and egg consumption. Men who eat ≥2.5 eggs/week had a 1.8-fold escalated risk of advancing lethal prostate cancer equated with men who eat <0.5 eggs/week [15-16]. Due to the choline content of the egg may accelerate the risk of prostate cancer progression. Study reveals that approximately 500mg/day of choline intake increase the risk 70% higher compare to those who take approximately 300mg/day [17]. The high levels of the choline in plasma leads to 46% of the higher risk of the prostate cancer than with men with lowest levels, is revealed from Swedish study [18].

b) Fish: The prostate cancer risk found through study is lower in the men who habitually eats fish, and from pooled study, it is found that

men with higher intake of fish had significant 63% reduced risk of the prostate cancer, whereas from other study it has been reported that there is no significant association among fish intake and the advancement of prostate cancer [19]. Overall, collective data suggest that fishes are rich in omega-3 fatty acids like salmon, sardines, mackerel, and herring, and in taking these fishes might reduce risk of prostate cancer significantly, clinically. Brasky et al. suggested through study that men with increased level of the long chain omega-3 fatty acids has higher prospect being diagnosed with prostate cancer [20-26]. Still, the investigation is under trial to connect the association between fish intake and prostate cancer lowering risk or death.

c) Poultry: An investigation conducted on the poultry intake it is found that skinless poultry intake had no link with occurrence of the prostate cancer before diagnosis or after diagnosis. In demarcation, consumption of higher dosages of the poultry with skin had 2.26-fold higher risk of reoccurrence of the prostate cancer after diagnoses with comparision of those consume less. [16].

d) Processed red meat: Food such as salami, sausage, bacon like processed food shows positive association with advance and fatal prostate cancer [27], whereas , others reported no association [16, 28]. Although strong data are missing as to whether processed red meat enhances risk of prostate cancer progression, a substantive ground shows that processed red meat enhances the risk of other diseases and all-cause mortality.

2. Dietary factors: plant products

a) Coffee: Several investigation were performed to find the association with coffee and prostate cancer and found that pre-diagnostic coffee intake is linked with reduction in the risk of the developing lethal prostate cancer, this finding is supported by Wilson KM et al.(2011) through his study and many finding suggest and support this outcome, but not all . One of the current analyses by Geybels et al. suggests that many investigation tested coffee intake before prostate cancer diagnosis [29-31]. The post-diagnostic coffee intake and risk of progression of prostate cancer association has not been studied till date.

b) Cruciferous vegetables: Unremarkably ingested cruciferous vegetables like: broccoli, cabbage, brussels sprouts, kale, cauliflower, mustard greens, and chard greens. Laboratory investigation and animal model testing remark that metabolites of cruciferous vegetables, isothiocyanates, and indoles, might detoxify carcinogenic compounds, and could be helpful to stop cancer cells from growing, dividing, and promote apoptosis [32]. According to one of the research on the cruciferous vegetable intake found that the highest quartile intake after diagnosis of non-metastatic prostate cancer had lowest approximately 59% chances of progression of cancer in comparisons with lowest quartile [33].

c) Soy: The presence of the isoflavones in soy (a versatile bean) product like soy milk, soy sauce, miso (soybean paste), tempeh (which is kind of like a soy cake), and tofu, inhibit prostate cancer growth, progression, migration and metastasis, accoriding to the laboratory and animal studies. Studies found the soy intake is higher in Asian population than Western population, and intake is inversely linked with progression and chance of prostate cancer [34]. However, the available data is very small to elaborate the association of the soy consumption and prostate cancer. In counterpoint, one minor 2-year controlled test no significant effect were found of a soy supplement on chance of prostate cancer progression among men with localized illness [35]. However, an attentive research is required, because based on available facts it is difficult to support the hypothesis strongly that enhancing soy intake will reduce prostate cancer progression.

d)Tea: In Asian population, many epidemiologic investigation propose that tea consumption might linked with reduced chances of prostate cancer [36-37], but, according to the current meta-analysis report there is no overall link of tea intake and the prostate cancer progression [38]. However, meta-analysis study reveal that consumption of the green tea might be beneficial, but again, the result were dictated by minor dependable studies of case –control, but tea extract clinical trials shows promising results for future studies [39-40].

e)Tomatoes/lycopene: The presence of the antioxidant nutrient like lycopene is higher in tomatoes and it participate in inhibiting the growth and metastasis of cancerous cells[41] and consuming the tomatoes product linked with reduced chances of the progression of the prostate cancer [42] , whereas , few studies denies this finding [43].

3. Dietary factors: dairy/calcium, dietary fats, and supplements

a) Dairy/calcium: According to the investigation, the intake of the higher (the recommended dosages ~1000 mg/day) consumption of the calcium linked with the prostate cancer progression. Data is limited on post-diagnostic calcium and dairy intake. In counterpoint, in spite of limited data, intake of low-fat dairy foods has not been regularly associated to inauspicious effects after a prostate cancer diagnosis [44-46].

b) Supplements: A regular multivitamin is secure and may be beneficial, suggested by available evidences. Based on the recent study of selenium supplementation after diagnosis in relation to prostate cancer mortality found that men 140+ μg/day of selenium after diagnosis had a 2.6-fold enhanced risk of prostate cancer mortality. One of an important exclusion to turning away of single nutrient supplements is vitamin D, before taking this supplement the level should be check for its intake requirement [47-49].

4. Reactive Oxygen and Nitrogen Species

From the past three decades the published literature suggests that reactive oxygen species and reactive nitrogen species can trigger, enhance and modulate cancer progression. The formation and decomposition of the ROS (Reactive oxygen species) and RNS (Reactive nitrogen species within cells and influence the physiological changes and cell damages. The supplementing diet with antioxidant can be promising effects to reduce carcinogenesis and can promote health, but supplementation in excess amount can act as carcinogenic [50]. Oxidative stress (OS) also influence the activities of inflammatory mediators and other cellular mechanism demanded in the initiation , progression and enhancement of human neoplasm including prostate cancer .Scientific studies emphasize that supplementation with micronutrient can repair the antioxidant condition and hence can ameliorate the clinical results for PCa (Prostate cancer) and BPH (prostatic hyperplasia)patients [51]

II. CONCLUSION

In the prostate cancer progression there are several dietary and life style factor taking an important part. In contrast, there are many potential protective dietary nutrients are available for prostate cancer but if it is taken in the defined limits. Hereafter investigation might assisted well to stress on revealing add-on gene-nutrient or food interactions, and thus beefing up the evidence of linking and detecting populations that might get benefitted from dietary alterations. Future and on-going trials and investigation might further enlighten the role of diet and immunotherapy for prostate cancer prevention and cure .The strong contribution is required from the research institute, research scientist, physicians, government officials and biopharmaceutical industry to eliminate the obstacles that impede progress towards cure and advocating mass for greater awareness about the prostate cancer for prevention and way of fighting against this disease.

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