POLICY AND PRACTICE

Research on Nutrition and Cancer: The Importance of the Standardized Dietary Assessments

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Abstract

Diet is a multidimensional variable, with diversity and composition as two important factors. It has been shown in one study that consumption of foods from a limited number of food groups reduces diversity and results in increased risk of early mortality. Eating habits are influenced by many biological, social, psychological, and cultural factors. Much research on strategies to promote healthful eating patterns that may prevent or control some cancers has been conducted over the past two decades. It's therefore essential that the APOCP promotes investigation of the role of diet-related and lifestyle factors in cancer, using a multidisciplinary approach that involves large population-based prospective studies in which biological samples are collected and analyzed for biomarkers of diet, metabolic processes and genetic susceptibility. Several large cohort studies need to be initiated and coordinated for Asian Pacific countries in the future. Development of methods for adjusting for measurement error in estimates of exposure, for validating and calibrating intake and for standardizing dietary assessment is a high priority.

Key words: Nutrition – food diversity and composition – cancer

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Nutrition and Cancer

Cancer and cardiovascular diseases are two pathological states involving uncontrolled proliferation of either tumor or vascular smooth muscle cells. Interestingly, both types of disease can be prevented by the same type of chemical agents, such as marine polyunsaturated fatty acids, sulfur-containing compounds present in garlic, and wine polyphenols, among others, as indicated by numerous epidemiological studies and laboratory experiments involving animal models (Argiles et al., 1998).

Potential Impact for Preventive Practice

Only south-central and western Asia (Indian subcontinent, central Asia and the middle-eastern countries) and Northern Africa are well below the world average of 90 deaths per 100,000 population annually (Pisani et al., 1999). In men, the risk of dying from cancer is highest in eastern Europe, with an age-standardized rate for all sites of 205 deaths per 100,000 population. Mortality rates in all other developed regions are around 180 (Pisani et al., 1999).

The only developing area with an overall rate of the same magnitude as that in developed countries is southern Africa. All of eastern Asia, including China, has mortality rates above the world average, as do all developed countries. The region of highest risk among women is northern Europe (age-standardized rate = 125.4), followed by North America, southern Africa and tropical South America (Pisani et al., 1999) .

Cancer is the Second Cause of Death in Turkey

Cancer cases have been collected since 1983, but, the total number of cases has just reached to 30,000 per year, while we have reported 100,000 cases a year at least. For that reasons, Ministry of Health, Department of Cancer Control established the cancer incidence project in 1991 in collaboration with Ege University Cancer Research Center in Izmir and the Turkish-American Health Center in Massachussettes. Since November 1992, Izmir Cancer Registry has been in collaboration with the IARC (Cancer Registry Report of Turkey, 1997) .

The cancer registry is an essential part of any rational program of cancer control (Jensen et al., 1991) . Izmir Cancer Registry has the first population-based cancer registry data in Turkey (WHO/IARC Biennial Report, 2001) , which can now be used in a wide variety of areas of cancer control.

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Table 1. The First Population-based Cancer Incidence Rates (Izmir Cancer Registry) in Turkey.

In	%	Annual incidence rate
Females		
Breast	26.7	24.4
Skin (except MM)	8.8	8.8
Corpus Uteri	6.5	6.4
Over and Fallopian T	6.4	5.9
Cervix Uteri	5.9	5.4
Trachea, Bronchi Lungs	5.2	5.1
Males		
Trachea, Bronchi Lungs	38.6	61.4
Skin (except MM)	7.1	11.5
Larynx	6.9	10.6
Bladder	6.8	11.0
Stomach	5.1	8.0
Prostate	3.1	5.4

Per 100.000 population, age-standardized rates, 1993-1994 data base

For example, cancer registry information has served as an endpoint in numerous cohort studies to evaluate risk associated with occupational exposures, drug-taking, smoking, diet etc (Jensen et al., 1991; Parkin and Coleman, 1990) .

The Cancer Registry has a Pivotal Role in Cancer Control (Jensen et al., 1991)

The value of cancer registry depends on the quality of its data and the extent to which they are used in research and health service planning. Epidemiological research, based on comprehensive cancer registration, remains the most valid and efficient way to plan and evaluate all aspects of cancer control (Jensen et al., 1991) .

Despite the Difficulties in Interpreting the Evidence onDiet several Agencies have Issued Dietary Guidelines intended to Reduce Cancer Risk (Parkin and Coleman, 1990).

Dietary influences on cancer risk have been estimated by many authors (Doll & Peto, 1981., Wynder & Gori, 1977., Higginson & Muir, 1979) to be at least as important as tobacco exposure, yet the role of diet in the causation of cancer has been difficult to study (Parkin and Coleman, 1990) .Dietary guidelines for health promotion and cancer prevention recommend (Damianaki et al., 2000; Glanz, 1997) ;

- consumption of less animal fat
- reduction of sodium intake
- daily consumption of fruit, vegetables, and whole grain cereal products (more fruit, vegetables and fiber)
- prevention of obesity
- avoidance of excess alcohol intake
- avoidance of foods preserved by salt-curing, salt-pickling or smoking

Diet is a Multidimensional Variable.

Epidemiological studies have assessed diet and disease associations by evaluating absolute amounts of nutrients and foods consumed as well as by evaluating the amounts of nutrients per unit of energy intake (Slattery et al., 1997).

Eating habits are influenced by many biological, social, psychological, and cultural factors. Much research on strategies to promote healthful eating patterns that may prevent or control some cancers has been conducted over the past two decades. Environmental influences on nutrition practices include social norms and policies at the organizational, local, and national levels (Slattery et al., 1997) .

Among non-nutrients, salt intake is a likely component cause of stomach cancer, and intake of salty fish very early in life is linked closely to nasopharyngeal cancer in South-east Asia. The intake of very hot drinks increases the risk of esophageal cancer in Central Asia and South America (Trichopoulos and Willet, 1996) .

Diet Diversity and Composition.

One study of diet diversity and colon cancer showed that men with the most diverse diets had the higher risk of developing colon cancer, while another study showed that those with the most diverse diet were at lower risk of developing colon cancer (Slattery et al., 1997).Dietary micronutrients have been proposed as effective inhibitory agents for cancer initiation, progression and incidence (Argiles et al., 1998; Parkin and Coleman, 1990)

Breast cancer (one of the most common malignancy in Western societies), as well as esophagus, stomach, lung, bladder and prostate cancer depend on environmental factors and diet for growth and evolution. High vegetable and fruit (V&F) intake has been associated with a lower risk of many cancers (Smith et al., 1995).Plant foods have been hypothesized to reduce risk of cancer by the variety of bioactive compounds they contain, including polyphenolics, allium compounds, lignans and pytoestrogens, trace minerals, antioxidants and dietary fiber (Argiles et al., 1998; Damianaki et al., 2000; Smith et al., 1995) .

Cancer and cardiovascular diseases can be prevented by the same types of chemical agents, such as marine polyunsaturated fatty acids, sulfur-containing compounds present in garlic, and wine polyphenols among others (Argiles et al., 1998). Red wine is a rich source of polyphenols and their antioxidants and tumor arresting effects have been demonstrated in different in vitro and in vivo systems in recent years (Damianaki et al., 2000)

Plant Consumption in Turkey shows Great Diversity

Fresh vegetable and fruit consumption is rather higher in Thrace, Marmara, Eegean and Mediterranian Regions than Central Anatolia, East West, East and South East Anatolian Regions (Köksal, 1977) . Eating habits may be influenced by environmental differences in disparate geographic regions

(Parkin and Coleman, 1990).

It is well known that these molecules behave as radical scavengers and antioxidants such as: Grapes (Red-wine) rich source of polyphenols (antioxidants and tumor arresting effects); Garlic (allium sativum): tumor arresting effects; Viscum Album (European Mistletoe): herba visci extract (treatment for hypertension, rheumatism, tumor therapy (adjuvant) and scador (cancerostatica); Helmittor/heilmittel (adjuvan therapy); Urtica: rich source of carotenoid and chlorophylls (antioxidants and tumor arresting effects); Solidago: tumor arresting effects; Nerium oleander (NO) extract: was used in cancer therapy; Catharantus: (indol and indolin alcoloids). Vinblastin and vincristin alcoloids, colchicin (cytostatica) (was used in leukemia and lymphogranulomatose therapy) Turnip(Brassica rape) and Pancar (Beetroot): Rich source of A,B,C vitamins (antioxidants and tumor arresting effects) and Ca,Fe minerals. Cabbage (Black): A special.kind of brassica vegetables. (Anticarcinogenic effects) (Argiles et al., 1998; Damianaki et al., 2000; Güven, 1989; Trichopoulos and Willet, 1996) .

Grapes (red wine), garlic, brassica rape, viscum album, solidago, urtica, nerrium oleander, catharantus, black cabbage, beetroot have been planted and demonstrated against cardiovascular diseases and cancer in Turkey (Akçiçek, 1997; Anonymous, 1999; Güven, 1989).

Recommendations

If the goal of the Asian Pacific Organization for Cancer Prevention (APOCP) Training Centre is to act as a focal point, located conveniently in Bangkok, Thailand, to facilitate and coordinate activities of the specialists in the different areas of cancer prevention (Boribalburiphand, 2001) :

Several Large Cohort Studies should be Initiated and Coordinated for Asian Pacific and Euro Asian (Turkey) Countries in Future in Collaboration with the IARC.

Therefore the APOCP should investigate the role of diet-related and lifestyle factors in cancer, using a multidisciplinary approach that involves large population-based prospective studies in which biological samples are collected and analyzed for biomarkers of diet, metabolic processes and genetic susceptibility.

Methods should be Developed for Adjusting for Measurement Error in Assessment of Exposure, for

Table 2. Food Consumption According to Regions in Turkey (Grams/consumer unit/per day)

Food Items		Average consumption according to regions				
No. of Families	National Average	I	II	III	IV	V
	3533	1144	390	884	548	567
Bread	502.0	489.0	457.0	509.0	490.0	553.0
Other wheat products	67.2	45.1	63.9	76.8	79.1	87.5
Rice	27.6	33.7	30.2	22.7	27.2	22.1
Corn and other cereals	19.4	6.7	92.9	13.3	7.4	15.6
Milk	30.8	40.8	34.3	25.7	27.4	19.3
Yogurt	67.6	48.6	70.2	54.6	62.9	139.8
Cheese and other milk products	29.6	37.1	25.7	26.8	22.1	28.8
Meat	61.2	73.0	38.4	66.1	52.3	53.7
Chicken	3.7	5.0	1.4	4.2	2.8	2.5
Fish	4.3	6.1	10.1	3.5	1.7	0.5
Egg	11.3	11.9	10.2	16.6	7.0	6.3
Dry pulses	12.2	15.8	6.1	16.2	10.7	4.0
Potatoes	40.1	40.3	58.6	49.9	32.5	19.1
Fresh vegetables (all kinds)	361.3	397.9	340.1	306.7	392.7	309.5
Fresh fruits (all kinds)	276.9	315.4	158.3	221.6	350.4	263.9
Butter and other	7.5	4.6	9.0	11.3	4.3	9.3
Margarine	16.2	19.8	9.4	15.6	17.2	13.5
Vegetable oil (olive oil included)	23.6	38.8	24.8	17.7	19.3	5.0
Sugar and other sweet products	45.3	47.6	52.0	51.6	32.0	38.9

Region I Thrace, Marmara, and the Aegean Region
Region II Black Sea (East-West) Region
Region III Central Anatolia
Region IV Mediterranian Region
Region V East and South East Anatolia Region

Validating and Calibrating Dietary Measurements and for Standardizing Dietary Assessments.

Efforts in this area of primary prevention should be made by the APOCP in coordination with individual Asian countries to include all actions aimed at reducing the occurrence of cancer.

"A Basic Training Course on Cancer and Nutrition" should be periodically organized by APOCP for Asian Pacific and Euro Asian (Turkey) Health Care Providers

Nurses and midwifes are the most important health care providers to train people about dietary guidelines for health promotion and cancer prevention. The former mainly resulted in increase knowledge, and some programs also promote skill development and adoption of new habits. The latter sometimes achieve short-term behavior changes. Both types of strategies reached only the most motivated individuals (Glanz, 1997) .

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