Original Article

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Turkish Ministry of Health, 2nd Turkish Medical General Assembly Clinical Oncology Study Group Report

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ABSTRACT

Objective: There is an increase in the incidence of cancer, and consequently in mortality rates, both in the world and in Turkey. The increase in the incidence and mortality rate of cancer are more prominent in our country as well as in other developing countries. The aim of this workshop was to determine the current status on prevention, screening, early diagnosis and treatment of cancer in our country, to identify related shortcomings, specify solutions and to share these with health system operators, and to aid in implementation of these systems. Developments on palliative care were also evaluated.

Materials and Methods: The current situation in the practice of clinical oncology, related drawbacks, problems encountered during multidisciplinary approach and their solutions were discussed under several sub-headings during a 3-day meeting organized by the Turkish Ministry of Health (Türkiye Cumhuriyeti Sağlık Bakanlığı- TCSB) with participation of 16 scientists from Turkey and 6 from abroad, and the conclusions were reported.

Results: It is expected that the newly established Turkish Health Institutes Association (Türkiye Sağlık Enstitüleri Başkanlığı-TÜSEB) and the National Cancer Institute (Ulusal Kanser Enstitüsü) will provide a new framework in the field of oncology. The current positive findings include the increase in the number of scientists who carry out successful trials in oncology both in Turkey and abroad, the implementation of the national cancer registry program by the Cancer Control Department and the breast cancer registry program by the Turkish Federation of Breast Diseases Societies (Türkiye Meme Hastalıkları Dernekleri Federasyonu-TMHDF), and introduction of Cancer Early Diagnosis, Screening, and Training Centers (Kanser Erken Tanı, Tarama ve Eğitim Merkezi-KETEM) for the application of community-based cancer screening programs. In addition to these, obvious shortcomings related to education, implementation, management and research issues were also determined, and policy and project proposals to address these issues were presented. Collaboration with relevant organizations in the implementation of these studies was supported.

Conclusion: Both the incidence and mortality rates of cancer are increasing in Turkey. The widespread deficiencies in population-based screening and in effective treatment lead to an increase in delay in diagnosis and mortality. Despite improvements in data recording, screening and treatment over the last 10 years, extensive, organized, population-based screening programs and fully equipped early diagnosis and treatment centers are required. Enhancement of basic cancer epidemiologic, translational, genetic and molecular research studies is essential in our country. Improvements on pain treatment and palliative care of patients with chronic and terminal cancer are also required.

Keywords: Workshop, cancer, Turkey, incidence, prevention, screening, National Cancer Institute

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Introduction

The incidence and mortality of cancer is increasing all over the world, in parallel to population growth, aging, stress, nuclear waste, obesity, inactivity, improper diet, processed foods, smoking, and alcohol consumption (1-10). In developed countries, lung and prostate cancers are the most common cancer types in men, whereas breast and colorectal cancers are seen more often in women (1, 3, 5). In developing countries, lung, gastric, and liver cancers are common in men, and breast and cervical cancers are seen more often in women (3, 4).

The World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) announced that in 2012, cancer was diagnosed in 14.1 million people and 8.2 million died of cancer worldwide, and that 32.6 million people who were diagnosed as having cancer within the last 5 years are alive (1). Fifty-seven per cent of patients with newly diagnosed cancer (8 million) and 65% of cancer deaths (5.3 million) were reported from developing countries.

The incidence of cancer is 25% higher in men (205/100 000) than in women (165/100 000) (5). The age-adjusted cancer incidence in men in West Africa (79/100 000) is five times less than in Australia (365/100 000), and is three times less in South-Central Asia (103/100 000) than in North America (295/100 000).

The regional differences in mortality are less striking; the mortality rate is 15% higher in men, and 8% higher in women in developed countries than in developing countries (1, 3, 5). The high mortality rate in developed countries is attributed to the significantly higher incidence rate.

The changing lifestyle in Turkey, such as changes in reproductive function, nutritional habits, obesity, inactivity, increased smoking and alcohol use, population growth, aging, and increased awareness have led to an increase in cancer incidence and cancer-related mortality (4). In Turkey, the age-adjusted cancer rates for men and women in 2012 were reported as 277.7/100 000 and 188.2/100 000, respectively (2, 4, 7). The increase in breast cancer incidence could may reflect the increase in cancer incidence in Turkey (9-11). The incidence of breast cancer in Turkey in 1993 was reported as 24/100 000; in the last 20 years it has more than doubled and has reached 50/100 000.

Despite the increase in the incidence of cancer in Turkey, the lack of for nationwide cancer prevention and population-based screening programs, and low cancer awareness remains a significant problem. For these reasons, advanced stages at diagnosis are usual. The rates of stage 0 and I breast cancer are 5% and 27%, respectively, according to the Turkish Federation of Breast Diseases Societies' (Türkiye Meme Hastalıkları Dernekleri Federasyonu-TMHDF) database, which includes more than 22 000 patients (10). There is also a delay in initiating treatment for advanced-stage cancer because of patient and system-related factors (12). In our study, which included 1038 patients with breast cancer, the total delay to treatment initiation was 14.8 weeks, most of which was related with the health system (10.5 weeks) (12).

The increase in cancer incidence and mortality in Turkey has led the Turkish Ministry of Health (TCSB-Türkiye Cumhuriyeti Sağlık Bakanlığı) to establish Cancer Early Diagnosis, Screening, and Training Centers (Kanser Erken Tanı, Tarama ve Eğitim Merkezi-KETEM) in the last 10 years, and aims to expand these centers both in number and distribution within the country, to create and initiate national screening programs, and to re-establish and modernize the already-existing cancer diagnosis and treatment centers. The facts that 50% of patients with breast cancer within the TMHDF database were aged less than 50 years, and that about half the patients who participated in the Bahceşehir Community-based Mammography Screening Project and diagnosed with breast cancer were aged 40-49 years, have led the mammography screening age in Turkey to be reduced from 50 years to 40 years (13).

Despite positive developments and breakthroughs in the Turkish health system, and the increase in society's awareness of cancer, neither the number nor the capacity for cancer prevention, screening, early diagnosis centers are sufficient. We know that this situation results in system-related delays in both diagnosis and treatment. Above all, the knowledge level of the target audience on cancer is quite low. Although the government has provided the necessary screening and early detection programs free of charge, the participation rate remains very low.

The aim of this workshop, which was organized by TCSB, was to determine the incidence of cancer in Turkey; stage at diagnosis; our status on prevention, screening, diagnosis, treatment and palliative care; to review basic studies on these issues; to recommend proposals to improve the current status to the level of developed countries; and to share them with health system operators.

Materials and Methods

The Turkish General Medical Assembly was held in Istanbul from October 29 to-31, 2015, by the Ministry of Health. During the 3-day meetings, the experts were divided into groups on 9 different subjects. One of these groups, the Clinical Oncology Study Group, consisted of 22 invited scientists and experts on cancer; 16 from Turkey, and 6 from the United States, the United Kingdom, and Germany. The fields of expertise of the participants were general surgery, surgical oncology, plastic surgery, urology, radiation oncology, administrative medicine, medical technology, and medical oncology. During the meeting, previously determined topics were discussed, and the final results of discussions and proceedings were shared among the participants (Table 1). The prepared study draft was sent to the participants twice, and they were asked to contribute. This article has been prepared in line with their contributions and criticisms.

Results

I. Analysis of the current status in Turkey:

It is expected that the newly-established Turkish Health Institutes Association (Türkiye Sağlık Enstitüleri Başkanlığı-TÜSEB) and the National Cancer Institute (Ulusal Kanser Enstitüsü) will provide a new framework in the field of oncology. The main aims and scopes of the institute should include three main headings: 1) Health Care: Services directed for all people and patients living in Turkey should be addressed under this heading. These services should include healthy living and cancer prevention, rapid and early diagnosis, early and effective treatment, regular follow-up and palliative care. 2) Research: Under this heading, cancer-related demographic, epidemiologic, etiologic, social and cultural background research studies should be performed and enhanced in Turkey. Results from these research studies can demonstrate cancer-related factors, cancer incidence and prevalence by age, frequency, distribution according to regions and cities, and required protective measures and infrastructures. Within the clinical trials; overall cancer incidence, prevalence according to organs, stages, prevention, diagnosis and treatment facilities, and the adequacy of existing infrastructure should be investigated. Basic and clini-

Table 1. Clinical oncology working group discussion topics

1	The current situation in clinical oncology practice, inadequacies, problems encountered during multidisciplinary practice in our country
2	Strategic planning for the future in clinical oncology practice in developed countries
3	Medical and pediatric oncology practices and development strategies in our country
4	Development strategy for Surgical Oncology in our country and the world
5	What tasks should be undertaken by the Cancer Institute to improve clinical oncology
6	What should be the future development strategy for Radiation Oncology in our country
7	Things to be done for rapid improvement of pre-clinical and clinical research in our country
8	Is it necessary to determine the minimum standards of cancer treatment in our country, should the Turkish Cancer Institute take part in such efforts
9	What tasks should be undertaken by the Cancer Institute for the development of Clinical Oncology
10	Designing palliative care in oncology clinics
11	Obstacles in the treatment of chronic pain
12	End of life care standards
13	Advanced care plan for cancer

cal research centers should be identified, their uniform distribution throughout the nation should be provided, and election of members based on merit and maintenance should be ensured. Basic medical and clinical research projects, "translational" research programs that bridge these two traditional survey areas, relevant research and development (R&D) studies should be performed. 3) Education: Under this heading, platforms for acquisition/generation of knowledge and dissemination of information should be created for physicians, allied health staff, and research scientists working on cancer both within and outside Turkey. These three main goals and service mentality must be in complete harmony in both conceptual and practical application, with clearly defined, written, compulsory job definitions.

The current noted positive findings are the increase in the number of scientists who carry out successful trials in oncology both in Turkey and abroad, the implementation of the national cancer registry program by the Cancer Control Department and the breast cancer registry program by TMHDF; however, the number and application of community-based cancer screening programs and introduction of KETEMs is not sufficient, although these are expected to increase in number.

The noteworthy negative factors were identified as the lack of standardization in medical schools, which are growing in number; lack of their evaluation at regular intervals; lack of standardization and accreditation of cancer screening; early diagnosis and treatment centers; imbalanced distribution of corporate resources; lack of multidisciplinary studies; lack of communication between the management and system and the scientists-scientific centers; lack of guidelines on screening, diagnosis and treatment appropriate for national socio-cultural and economic structure; not implementing the guideline and programs; lack of audit of cancer diagnosis and treatment centers (e.g. radiology, radiotherapy centers); lack of preclinical and translational research; deficits in the knowledge level of trained scholars in the fields of genetics, molecular oncology and molecular radiobiology; lack of basic research in epidemiology, cancer screening and early diagnosis; lack of research in the field of basic oncology and local oncologic medications; lack of production; absence of palliative care centers; and insufficiency in practices.

II. Policy Recommendations

Policy recommendations are grouped under four headings; education, application, management, and research. Recommendations are categorized in Table 2.

A. Education:

The following embodiment is considered to be necessary:

1. Clinical and pre-clinical specialist training programs (Fellowship). These programs should be prepared as institutional programs, under the supervision of universities and academic associations, and within the framework of a standardized curriculum of clinical and laboratory studies.
2. Continuous medical education (CME) and implementation. A standard accreditation system for different formats of meetings, conferences, congresses, workshops (PRA Physician's Recognition Award and Credits System) should be introduced.
3. The establishment of a mechanism and infrastructure for International Education/Teaching
   - 3.1 Invitation of cancer specialists/researchers living abroad to scientific meetings, and planning congress/conferences in collaboration with international institutions/organizations
   - 3.2 Creating links with international institutions/organizations in health care sector based on a mutual exchange of research and education (Organic Affiliation)
   - 3.3 Defining terms of international experience for doctors, health professionals, and researchers who work with cancer, organizing recruitment conditions, and determining the conditions of fund allocation
   - 3.4 Invitations of students, physicians, researchers, experts in a special fields and teachers from developed countries and performing exchange program from Turkey to these countries similar to Erasmus Programs 3.5 Establishing Turkish cancer organization/institutions for training and teaching abroad.

Standardization and ensuring quality control have been proposed as being essential for student, resident, and clinical oncology fellowship (surgery, medical oncology, radiation oncology, molecular biology, liaison psychiatry) programs at medical faculties, and teaching and research hospitals. Supporting proficiency tests, the implementation of a CME scoring system, short-term rotation of faculty staff, and implementation of national-international visiting scholars were highlighted to reinforce this suggestion.

Implementation of sub-specialties in oncologic surgery (e.g. breast/endocrine, upper gastrointestinal, colorectal, hepato-pancreato-biliary),

Table 2. Policy suggestions

A.	**Education:**
1	Standardization of undergraduate, postgraduate and continuing medical education and ensuring regular accreditation
	Recommendation 1.1: Standardization of medical student, resident and fellowship education in Training and Research Hospitals and Medical Faculties, ensuring quality control
	Recommendation 1.2: Supporting proficiency tests, implementation of scoring in continuing medical education, short-term rotation of faculty members at national and international institutions as guest lecturers
	Recommendation 1.3: Establishing sub-specialties particularly in oncological surgery (breast/endocrine, upper gastrointestinal, colorectal, hepato-pancreato-biliary, etc.), providing the relevant fellowship education
	Recommendation 1.4: Establishing standardized national programs for continuing medical education at medical graduate and fellowship levels
	Recommendation 1.5: Promotion and accreditation of courses and training programs organized by scientific organizations and associations
2	Arranging the distribution of teaching staff
	Recommendation 2.1: Ensuring distribution of staff according to the priority criteria that will be determined based on the degree of adequacy and comprehensiveness of centers
3	Training intermediate personnel
	Recommendation 3.1: Increasing the number of nurses and technicians specialized in oncology, surgery, radiology/nuclear medicine
B. Management	
1	Increasing the number of cancer early diagnosis and treatment centers according to requirements, accreditation and standardization
2	Assessment of the distribution of physicians according to fellowship fields
	Recommendation 2.1: Ensuring homogenization
	Recommendation 2.2: Basing manpower calculations on features of the applied treatment instead of the number of patients due to an increase in the time spent per patient parallel to technological developments
3	Accreditation of knowledge and skills
	Recommendation 3.1: Periodic training of healthcare providers at State Hospitals, Universities, Training and Research Hospitals and accreditation of these training
	Example 3.2: Rewarding knowledge and skills.
C. Implementation	
1	Supporting multidisciplinary approach
	Recommendation 1.1: Compulsory intra-clinical evaluations such as weekly tumor board meetings, joint review meetings or web-based meetings to facilitate multidisciplinary approach, ensuring their organization and support
2.	Supporting palliative care as part of clinical oncology
	Recommendation 2.1: Aiming training on palliative care for physicians, nurses and health workers
	Recommendation 2.2: Implementation of the concepts of palliative care and intensive care according to the World Health Organization criteria
	Recommendation 2.3: Facilitating access to essential medicines for palliative care
	Recommendation 2.4: Determining the pain scores and the approaches for treatment
	Recommendation 2.5: Efforts on awareness of both patients and health workers about opioid use
	Recommendation 2.6: Providing the necessary legal arrangements for advanced cancer care plan (health care proxy, resuscitation support systems, etc.)
3	Standardization of Application
	Recommendation 3.1: Following-up establishment and implementation of national algorithms. The determination of molecular approaches to be used in clinical applications
	Recommendation 3.2: Regular control of reports guiding diagnosis (pathology, radiology, nuclear medicine) in cooperation with scientific associations, and of diagnostic and treatment centers (radiology, radiotherapy, chemotherapy, surgery, nuclear medicine), and their certification
D. Research	
1	Supporting Preclinical and Clinical Research
	Recommendation 1.1: Identification of the mandatory requirements (staff, materials, equipment, etc.) in the existing experimental medicine and research institutes and centers, and their correction, modernization and development,
	Recommendation 1.2: Making facilitative incentives,
	Recommendation 1.3: The selection of scientists to conduct scientific studies and projects according to scientific merit,
	Recommendation 1.4: Paying attention to ethical issues in science,
	Recommendation 1.5: Unbiased evaluation and rewarding of scientists.
2	Encouraging collaboration with Turkish academic staff abroad
	Recommendation 2.1: Opportunities should be created in this area, and be supported by appropriate wage policies.

and training a sufficient number of experts on these subspecialties were emphasized as a necessity.

Supporting courses and training programs organized by scientific organizations and specialist associations, and their inclusion in an accreditation system was proposed by the participants.

It was emphasized that the allocation of staff required to develop and to expand accreditation recommendations should be made based on the adequacy of centers and the degree of sophistication.

The determination of the required number of support staff (e.g. nurses, physicians, assistants, technicians) and generalization of their education as in some advanced health systems will alleviate the burden of doctors and facilitate patients' access for supportive treatment. Palliative Care Nursing Certification Training Program Standards are now in effect (approval number: 816 on 28.09.2015 by TCSB) (2). In-service training courses should be organized for physicians who are responsible for specialist palliative care centers, nurses, and psychologists with this initiative.

B. Management:

The main administrations (TCSB, TÜSEB, Turkish Cancer Institute, and so on) will determine the number and locations of cancer prevention, early diagnosis, treatment and education centers and hospitals (KETEM, State Hospital, Cancer Diagnosis and Treatment Hospitals, Oncology Institute) through basic studies, provide modern equipment and continuously monitor them. They ill provide substantial coordination, and will ensure training of health workers at regular intervals and ensure the training is accredited. In these applications, they will cooperate with professional institutions, associations and universities.

It was stated that due to an increase in the time spent per patient parallel to technological developments, manpower calculations should be based on features of treatment instead of the number of patients.

Organization of a modern cancer registry system, its continuous control, and data sharing all emerge as inevitable necessities to determine a national cancer policy. For this purpose, establishing an adequate secretariat to access the registration program, training, and managing them are also mandatory. Supporting propagation and control of the cancer registry program created by the Cancer Control Department, evaluation of the current data in this program, and sharing these data with the appropriate structures are necessary.

Therefore, the central patient record/data system should be compatible with the electronic file systems, which can be accessed by registered doctors and institutions (consultation notes, imaging, laboratory, and treatment notes), the national health and cancer registration system, and subjective cancer registry systems, and its structure should permit knowledge transfer.

Additionally;

1.1 Formatting health records

1.2 Standardization of image information system (e.g. PACS, picture archiving and communication system

1.1.2 A committee/sub-committee for diagnostic-treatment-indications guide: preparation of evidence-based guidelines on specific types of cancer (e.g. NCCN National Comprehensive Cancer Network)

1.1.3 Administrative Commission: Interpretation/evaluation of legislative amendments and adaptation in the field of cancer services

1.1.3. 1 Establishing full-fledged cancer centers (e.g. Comprehensive Cancer Center) approved by The National Cancer Institute, their approval and supervision

1.1.4 Ethics Commission: A commission should be established to protect the rights of patients and physicians.

A multidisciplinary approach should form the basis of clinical oncology practice; diagnosis and treatment decisions should be made by a multidisciplinary approach. The organization and support of weekly council meetings, intra-clinical evaluation meetings, and web-based meetings is proposed to facilitate the multidisciplinary approach.

It was emphasized that the new and rapidly developing palliative care in Turkey should be assessed as an integrated component of cancer treatment, which also requires a multidisciplinary approach. To elaborate on this proposal, it was recommended that palliative care training should target physicians, nurses and health officers; concepts of palliative care and intensive care should be organized in accordance with the World Health Organization criteria; access to essential medications should be facilitated; a standardized approach to pain scoring and treatment should be determined; awareness on the use of opioids should be raised in both health workers and patients; and that the necessary legal arrangements should be provided for an advanced-care plan study, including health proxy, and resuscitation support decisions.

Family physicians, at-home healthcare teams, palliative care clinics, and centers that belong to palliative care physicians are accountable for palliative care. Accreditation and standardization of these centers are required. It was suggested that in each province the Ministry of Health should identify a representative to monitor local progress at regular intervals, and report to the main administration.

Considering the developing health tourism in Turkey, indicators in accordance with international standards to show the success of oncologic surgery and post-surgery treatments should be disclosed transparently on a regular basis, and treatment results should be compared with those in developed countries.

It is proposed that national algorithms that aim to ensure the standardization of these practices should be established. The implementation of these algorithms should be monitored and molecular approaches should be configured for clinical applications. It is emphasized that reports that guide diagnosis (pathology, radiology, nuclear medicine) should be standardized in collaboration with scientific organizations.

C. Research:

Scientific research is the most important value that reflects the development level of a country, not only in the field of oncology, but also in all scientific fields. These studies should be arranged according to needs, especially in basic infrastructure, and must maintain continuity. The studies should be original and must contain common features of their international counterparts. Specific protection of the designers and practitioners of research studies in all aspects and rewarding their efforts will provide an important contribution to the promotion of the emergence of new national and international researchers and who excel in science. This year's award of the Nobel Prize in Chemistry to Prof. Dr. Aziz Sancar, the valuable scientist who carried out his career in the USA after graduating from Istanbul Faculty of Medicine, was a

great pleasure for our country, for the university in the USA in which he works, as well as humanity.

For scientific research:

1. Establishing "Translational Research" centers within corporate structures. This type of research is based directly on R & D and covers studies that result in clinical innovation.
2. Creation of prospective clinical research projects within corporate structures. To organize multicenter clinical studies with the participation of universities and academic institutions across the country (as in NSABP, National Surgical Breast and Bowel Project). To create and strengthen cooperation between universities and a culture of research that is unfortunately lacking in our country's medical tradition.
3. Creation of non-corporate project support mechanisms, programs and infrastructures
   - 3.1 Collaborative projects with TUBITAK
   - 3.2 Creating industry innovative research programs infrastructure (as in Small Business Innovation Research [SBIR] and Small Business Technology Transfer program [STTR])
   - 3.3 Creating infrastructure support for academic research projects. Programs in University structure and Special/Foundation research institute programs
4. Creation of a cancer research database: An electronic database that can be accessed by registered physicians and institutions. Compatible with National health and cancer registration system and centralized patient records/data system, in a structure that can provide knowledge transfer.
5. Forming a biobank

Increasing the limited number of centers in which basic oncology research can be conducted, providing trained scientists and necessary equipment for these centers were deemed to be extremely important for the establishment of our national data and treatment programs. In addition, providing incentives to facilitate scientific projects, selecting scientists to conduct scientific studies and projects according to scientific background and merit, paying attention to ethical rules, and unbiased evaluation and awarding of scientists are also of utmost importance.

Palliative cancer care should be in accordance with current conditions, modern, multidisciplinary, holistic, and based on a patient's requirements and wishes.

The development of the required palliative care services model for our country through analysis of available cancer data and human resources and to integrate this into the general health system are significant issues.

For the development of this program, it is mandatory to raise awareness about palliative care among health care workers as well as in the community, to disseminate palliative care units throughout the country, and to establish national organization models. Improving multidisciplinary teamwork and training of those within the team, as well as progress in research and quality are also required.

The necessary legal arrangements for such practices should be prepared in our country. These arrangements should include legislation on the establishment of palliative care centers, reimbursement of care services, and regulations on terminal sedation and the right for DNR.

We can classify palliative care barriers in Turkey as follows:

- The low level of awareness of palliative care in the community and health care teams
- Failure of planning palliative care in conjunction with antitumor therapy
- Obstacles in the accessibility of opioids
- Inadequate financial support
- Lack of trained health personnel

Deficiencies in laws relevant to practice.

To improve palliative care, implementation of a national palliative care program, establishment of national palliative care associations, standards relating to symptom control and EOL care, certification programs for doctors and nurses, and reimbursement of home care applications are required. In addition, creation of a pediatric palliative care program, determining the levels of opioids in international narcotics control boards, and increasing the national production capacity of morphine are important.

Thanks to our strong family ties, terminal patient care can be performed effectively at home. However, families should also be trained.

Project Suggestions

During the meetings, project proposals to improve cancer prevention, screening, diagnosis, and treatment strategies both in our country and in the world were discussed and configured. These recommendations are divided into two groups: 1. Suggestions for prevention, screening, and registration programs: this involves increasing the number of KETEMs and newly-established prevention, early diagnosis, training and screening centers, their modernization, educating their employees on a regular basis, and their regular control. Similar to the training courses in all cities organized by the Turkish Cancer Control Department together with TMHDF between 2009 and 2011, certification and postgraduate training courses are extremely important examples for the renewal of knowledge and skills of doctors and other health professionals interested in cancer. Such courses should aim at not only training health workers but also the community, and educational films and lectures should be included into primary and secondary school programs. At the same time, it is recommended that screening programs be planned in line with the reality of our country and in accordance with modern scientific developments; community-based screening and early-diagnosis centers should be established similar to the Bahçeşehir Community-based Long-term Mammography Screening Center; the cancer registry system should be elaborated in terms of organ cancers; and that the TMHDF Breast Cancer Registration Program could be used as an example. The cost-effectiveness analysis carried out within this project showed that the Bahçeşehir Screening Project was extremely cost effective, and that patients diagnosed through screening (asymptomatic) were given a chance of living an additional 5.87 years as compared with patients diagnosed without screening (symptomatic) (14).

Today, attention must be paid to individualization of cancer screening and treatment, and to the organization of screening programs based on the characteristics of people who participate in or on the genetic characteristics of detected cancers (15, 16). For this purpose, prospective multicenter clinical trials and genomic/molecular studies should be included within the second group of research projects. The multicenter clinical study designed by TMDFH entitled ''Effectiveness of

surgery in patients with metastatic breast cancer" is the first of its kind in the world, which poses a very valuable example in this regard (17). This study investigated whether surgery offers benefit to patients diagnosed as having metastatic disease; the 3-year follow-up results will be published next year. In addition, national and international multicenter studies that evaluated factors that caused delays in breast cancer diagnosis proved that considerable prospective clinical studies could be undertaken in our country (12). Moreover, the İstanbul University Oncology Institute Genetics Center is performing significant studies along with other university genetics and molecular research centers.

Activities, Studies, and Co-operations that can be developed

It was emphasized that in order for Turkey to excel in new study fields and important research topics, integrative oncology, genomic profiling, immunotherapy, inflammation, genomics, metabolomics, and nanotechnology issues should be prioritized. Collaboration of universities and scientists who enable progress in these fields without financial sacrifice are important for implementation such studies. The scientific cooperation agreement between Munich Ludwig-Maximillian University and Harvard University for this purpose where their faculty members are trained in Harvard and joint projects are held can be given as an example.

In order to prevent over-diagnosis and treatment in cancer, investigation of the genetic nature of tumors, and individualized diagnosis and treatments become extremely important (15, 16). Thus, unnecessary treatments, complications, and excessive costs related to over-diagnosis and treatment will be avoided. It is emphasized that cost/effectiveness studies on genomic profile evaluations (such as 21-gene profile, Mammaprint, PAM 50, and Endopredict) and specific agreements for their routine use in our country are required (18).

Discussion and Conclusion

When viewed globally, it can be determined that cancer incidence and mortality rates have increased, and cancer is the leading cause of mortality (19). These increases are more pronounced in developing countries (20). Therefore, implementation of serious health policies according to the economic, social, and cultural status, and trained health professionals in these countries, and their uncompromising practice are mandatory. Otherwise, serious economic and labor losses will occur due to high morbidity and mortality rates in cancer patients.

In Turkey, there is a serious increase in the incidence and mortality rate from cancer (2, 4, 7, 9). In a study regarding the incidence of breast cancer, the incidence of 24.1/100 000 in 1993 more than doubled to a rate of 50/100 000 in 2010 (10, 11). Changes in lifestyle and reproductive function (Westernizing lifestyle), obesity, increasing awareness of cancer, and the aging population all played an important role in this increase (19).

When developed and developing countries are evaluated separately, it appears that the type and incidence rates of cancers are different. In developed countries, lung and prostate cancers in men, and breast and colorectal cancers in women are more frequent. On the other hand, in developing countries, lung, stomach, and liver cancer in men, and breast and cervical cancers in women are more frequent (3, 19). Therefore, countries need to develop prevention and screening programs based on frequency of the most common cancer.

The first five most common cancer types in our country show similarities to those in the world and other developed countries (1-5, 19). In Turkey, lung cancer in men (60.4/100 000), and breast cancer in women (46.8/100 000) are the most common cancers (2, 4, 9, 10). Childhood malignant tumors are listed as leukemia, lymphoma, and central nervous system tumors. In young men (aged 15-24 years), testicular cancer and Hodgkin's lymphoma, and in young women, thyroid and Hodgkin's lymphoma are the most common types. The more common types of cancer in developed countries are becoming more common in Turkey, parallel with the aging population and lifestyle changes because cancer is usually a disease associated with advanced age (6).

Based on the frequency of cancer in Turkey and the effectiveness of screening programs, screening programs are being applied for breast, cervical and colorectal cancer in women, and for colorectal cancer in men (2, 4, 7). These screening programs are being implemented in KETEMs founded by the TCSB, Universities, several hospitals, and private associations (13, 20). However, most of these programs are not regular and address-based community screening programs, unlike the Bahçeşehir Mammography Screening Project. Therefore, it is required that this sample screening project should be implemented throughout the country by establishing the infrastructure required for this system and training qualified health workers. In addition, target audiences should have cancer awareness for the implementation of screening programs on a regular basis. Adequate and continuous training programs should be conducted for this purpose (9). This similarity of these programs to programs in developed countries, and maintaining continuity are important.

Lung cancer is the most common type of cancer in men in our country, which is directly related to tobacco use. The law enacted by TCSB prohibiting the use of tobacco products in all indoor areas in 2008 has emerged as a serious step in the prevention of lung cancer in our country (2, 4). Implementing such activities without compromise and identifying the actual reduction in lung cancer incidence due to the prohibition of tobacco use with a regular cancer registry program will have serious deterrent effects and reduce tobacco use (8).

Currently, policies to combat cancer have become an important topic in both national health policies and international quality research studies. In the present context, if the Turkish Cancer Institute, which was established for cancer prevention, early diagnosis and effective treatment, acts for the purposes of its foundation, then one of the most important actions will have been taken in this regard. Similar institutions in countries such as the USA, Canada, France, and Korea have been established much earlier, and in addition to their contribution to cancer control programs in their own countries, they have also contributed to research studies on cancer in the entire world (21). It is one of the most important expectations that this organization prepares the necessary research environment for scientists in our country and abroad, and pioneer original scientific projects. Selection of projects to be implemented and of scientists to participate in these projects should be based on scientific value and merit for achieving reliable outcomes.

Cancer screening, early diagnosis, and effective treatment requires the collaboration of several specialties in medicine (22). The aim of obtaining a successful result can only be achieved by the cooperation of all related medical divisions. As in all areas of health, continuing medical education planning for both before and after graduation, and its implementation, standardization, and accreditation are required for all disciplines within the scope of oncology (23-25). Establishing standards of education and practice at the national level is extremely important for the holistic approach, and a requirement for medical

sciences (26, 27). Organizing weekly tumor councils that require collaboration and controlling such efforts will result in treatment success. For example, an increase in the rates of resection in lung cancer was achieved with the introduction of councils; the unnecessary diagnostic procedures were reduced and treatment delays were avoided (28). The implementation of equipped screening and treatment centers in our country, increasing the number of centers and experts on the subject according to needs, and their homogeneous distribution are essential for success in the early diagnosis and treatment of cancer.

The World Health Organization defines palliative care as an approach aimed at the prevention and relief of suffering by early diagnosis, and thorough evaluation and treatment of pain, physical, psychosocial and spiritual problems in patients facing the life-threatening disease cancer and their relatives (29). In this context, the aims are elimination of pain and other distressing symptoms; offering respect for life and death as a normal process; ensuring elimination of problems with the principle of neither hastening nor postponing death; managing symptoms; and improving quality of life with the active participation of physicians and nurses from specialties such as algology, radiation oncology, medical oncology, psychiatry, physical therapy and rehabilitation, internal medicine, surgical nursing, surgical divisions, and pulmonology (30-33).

In our country, there are very few centers for palliative care of cancer patients and experts on the subject. System operators and educational institutions dealing with this issue should come together, determine the number of patients in need of this approach based on a sound recording program, establish modern centers accordingly, and provide training for employees in these centers.

In conclusion, both the incidence and mortality rates of cancer are increasing in Turkey. The widespread deficiencies in population-based screening and in effective treatment lead to an increase in delay in diagnosis and mortality. Despite improvements in data recording, screening and treatment over the last 10 years, extensive, organized, population-based screening programs and fully equipped early diagnosis and treatment centers are required. Enhancement of basic cancer epidemiologic, translational, genetic and molecular research studies is essential in our country. Improvements on pain treatment and palliative care of patients with chronic and terminal cancer are also required.

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