Population of elderly patients with cancer – a growing public health problem in the perspective of national health programmes in Poland

Populacja starszych pacjentów z chorobą nowotworową – rosnący punkt na horyzoncie zdrowia publicznego w perspektywie narodowych programów zdrowotnych w Polsce

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KEY WORDS:

- geriatric oncology
- epidemiological transformation
- screening tests
- cancer survival
- ageing

ABSTRACT

We are witnessing an unprecedented increase in the population of elderly people in Poland and other countries. A large number of these people are at risk of falling ill with cancer. In recent years, medicine has successfully reduced mortality from cardiovascular diseases. Unfortunately, it has been impossible to achieve a significant reduction in cancer mortality, especially in countries with a medium-high human development index, including Poland. The mortality of elderly people due to cancer is particularly difficult to reduce. Screening programmes should be targeted primarily at the older people. The number of people who are unnecessarily tested to diagnose one case of cancer is the lowest in this population. However, screening methods are nonspecific, result in cancer overdiagnosis, extend the lead time, but do not reduce mortality. New screening methods that identify the highest-risk conditions should be developed primarily for the use in the older population. Survivorship care plans for patients who have had cancer are equally important for elderly and younger people. They allow younger patients to resume active life and work. In the elder, they may facilitate control of comorbidities likely to exacerbate after cancer treatment. These exacerbations increase the costs of hospital treatment, reduce the quality of life and increase mortality for reasons not directly related to cancer. The higher cancer mortality rate in elderly patients is partly associated with the fact that treatments with proven effectiveness in younger patients are not used in elderly people because there is no evidence for their clinical benefit but also because they may be overtreated. Relevant studies are currently being carried out by specialized institutions. These challenges should be considered in the debates on the priorities of updated versions of the National Cancer Control Programme and the National Health Programme.

SŁOWA KLUCZOWE:

- onkologia geriatryczna
- transformacja epidemiologiczna
- badania przesiewowe
- przetrwanie choroby nowotworowej
- starzenie się

STRESZCZENIE

Jesteśmy świadkami bezprecedensowgo wzrostu populacji ludzi starych, także w Polsce. Duża część z nich ma szansę zapaść na chorobę nowotworową. Sukcesem medycyny ostatnich lat jest zmniejszenie umieralności z powodu chorób naczyniowo-sercowych. Niestety nie udało się dokonać znaczącej redukcji umieralności z powodu nowotworów, szczególnie w krajach średniego poziomu rozwoju demograficznego, do jakich wciąż można zaliczyć Polskę. Umieralność wśród ludzi starszych z tej przyczyny jest szczególnie trudna do ograniczenia. Programy badań przesiewowych powinny być kierowane przede wszystkim do ludzi starszych. Liczba osób, które muszą być poddane niepotrzebnie badaniu aby rozpoznać jeden przypadek nowotworu jest najniższa w tej populacji. Jednakże stosowane metody skriningu są nieswoiste i prowadzą do nadmiernego rozpoznania, wydłużając czas wyprzedzenia diagnostycznego a nie zmniejszając umieralności. Nowe metody badań przesiewowych, identyfikujące stany najwyższego ryzyka, powinny być rozwijane przede wszystkim dla starszej populacji. Programy rekonwalescencji po przebytej chorobie nowotworowej są równie istotne dla ludzi starych jak u młodych. Młodym mają pozwolić wrócić do aktywnego życia i pracy. Konsekwencje samej choroby i agresywnego leczenia dekompensują choroby współistniejące. Podwyższa to koszty leczenia szpitalnego z powodu ich zaostrzenia. Obniża jakość życia, podwyższa umieralność z przyczyn niezwiązanych bezpośrednio z nowotworem. Wyższy odsetek zgonów z powodu nowotworów u ludzi starych jest po części spowodowany niewykorzystywaniem u nich metod leczenia o dowiedzionej skuteczności u młodych. Zaniechania te są spowodowane brakiem dowodów na korzyść kliniczną. Badania są wykonywane aktualnie przez wyspecjalizowane instytucje. Powyższe obszary powinny być przedmiotem rozważań przy dyskusjach nad priorytetami następnych edycji Narodowego Programu Zwalczania Chorób Nowotworowych i Narodowego Programu Zdrowia.

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Epidemiology

Age is the most important risk factor for cardiovascular diseases and cancer. However, with advances in prevention and cardiological treatment, and also with increasingly available techniques offered by interventional cardiology, mortality due to cancer will begin to dominate in the population of older patients. In countries with high values of Human Development Index (HDI) better management and higher expenditures on prevention and treatment of cardiovascular diseases resulted in a 53% decrease in the mortality rate for cardiovascular diseases in years 2006-2010 compared to 1981-1985. During the same period, in countries with medium high-HDI mortality for the same reason was reduced by 19%. Consequently, the cancer mortality rate was reduced by 17% in high-HDI countries and only by 5% in medium high-HDI countries (including Poland) (1).

Studies on the Global Disease Burden and Prospective Urban and Rural Epidemiology (PURE) revealed that in High Income Countries (HIC) the incidence of deaths due to cancer is already two-fold higher than those due to cardiovascular diseases. Poland, which is among the medium-high Income Countries (MIC), is approaching this epidemiological transformation. The PURE study also presents: data on risk factors for vascular diseases tested according to the INTERHEART protocol, and data on the number of hospital admissions and use of cardiological drugs. Interestingly, the difference between groups in the risk of vascular diseases is 20-30% and the highest in HIC, but the incidence and mortality due to vascular diseases are the highest in the low-income countries (LIC). The hazard ratio (HR) of the incidence was 1.14 for MIC and 1.15 for LIC compared to HIC. Despite the lowest incidence, the number of hospital admissions due to vascular diseases and the use of cardiological drugs are highest in high income countries. This translates into the lowest one-year mortality due to these diseases. However, this does not apply to cancer, and cancer mortality is the highest in high income countries. This proves the low effectiveness of preventive methods and treatment in cancer (2).

Cancer is currently the most common cause of death in both sexes in patients aged between 60 and 79 years (3). In developed countries, over 50% of cancer cases occur in patients aged 65 and over (4). Compared to younger patients, the risk of morbidity and mortality due to cancer are 11 times and 16 times greater in patients older than 75 years (5).

By 2050 the share of elderly people in the population of Poland is expected to increase by 5.6 million (nearly 20%). Most importantly, the number of elderly people is expected to significantly increase in the coming years, when baby-boomers born in the 1950s and 1960s will reach old age. We are witnessing a dynamic increase in life expectancy, but a simple extrapolation of actions taken in response to this process by Scandinavian and Western European countries can be deceptive. In Poland, the life expectancy of men aged 65 is almost 4 years shorter than their peers in France or Switzerland. Exacerbation of comorbidities and reduced vital organs reserves limit the possibilities of cancer treatment with aggressive methods (6).

The effectiveness of actions aimed at the general population to control a highly fatal disease should be measured mainly by mortality reduction. According to key public health concepts, this goal can be achieved by primary and secondary prevention. In the case of cancer, there is a belief that the widespread use of methods for early diagnosis of diseases, when the primary lesion can be treated with localized methods (surgery, radiation therapy), will bring health benefits for the whole population. This reasoning may be deceptive in relation to the population of elderly patients. In view of benefits for the whole society, screening does not change much for most deadly cancers. A relatively large number of patients is diagnosed with interval cancers due to the rapid development of advanced cancer detected between screening tests. After introducing new methods of early cancer detection, an increase in the incidence rate is observed. This phenomenon is called the prevalence wave and refers to a situation when a larger number of cancer cases without overt clinical symptoms are diagnosed. The use of tests detecting tumours at the asymptomatic stage increases the survival rate. However, this is not always associated with reduction in mortality. Cancer detection does not necessarily affect the natural course of the disease. Death may occur after a similar duration of illness as for patients who did not undergo screening to detect early disease. Following incidence and survival rates in monitoring the effectiveness of preventive programmes can lead to misallocation of public funds.

In the case of cancers with better prognoses, the concept of overdiagnosis and unnecessary treatment comes to the fore. An elderly patient diagnosed with cancer does not necessarily have to die because of that cancer. Other causes of death, mainly cardiovascular diseases, make screening in older age groups less effective. This is despite the fact that risk of cancer (measured by incidence) in older age is objectively higher than in younger age groups. If there is a low risk of progression, cancer detected by screening tests and then treated in accordance with the standard protocol may cause death equally often as the disease detected based on clinical symptoms. The difference in time between the diagnosis by screening and the diagnosis based on clinical symptoms (i.e. lead time) captured in statistics has no clinical significance to public health. The increase in survival captured in statistics may not be reflected in real life. Moreover, statistical methods used for the evaluation of screening tests may be biased and highlight the benefits of detecting less aggressive cancer types. This type of statistical error is called the length-time. The length-time is a selective bias, a standard deviation that favours longer analysed intervals and causes the asymmetry of data. In controlled studies, assessing the value of screening in particular cancer types may give the impression that screening contributes to better outcome of oncological treatment, but in fact it has no such effect (7).

Screening tests in elderly patients

Apparently, there is a need to continue health screening programmes in elderly patients. Nevertheless, when doing so, negative health effects of screening that do not provide clinical benefit, and the costs of screening should be considered. According to the currently accepted guidelines, screening should be offered to patients with a life expectancy of 10 years or longer. The severity of major comorbidities should also be considered, such as cardiovascular insufficiency, chronic obstructive pulmonary disease, renal failure, depression, and neurodegenerative diseases. Screening should be continued after a detailed discussion between the physician and the patient about the benefits and risks resulting from their often false positive or clinically useless results (8). A particularly hot debate among experts concerns

screening for prostate cancer (9). For low-risk prostate cancer, watchful waiting is recommended. However, studies carried out by Japanese researchers revealed that only 20-35% of the oldest patients agree to this approach, while others expect radical treatment (10). On the other hand, high-risk cancers are more often diagnosed in older patients who have never been screened at the time of onset of clinical symptoms. The odds ratio for detecting high-risk disease in this case is 3.39. However, it is unclear whether this is associated with a higher incidence of metastatic cancer or higher cancer mortality (11).

The future solution may be to select the highest risk groups using improved screening methods, based on low-invasive techniques for assessing cancer cell elements and cancer markers circulating in peripheral blood. The liquid biopsy of peripheral blood is aimed at detecting protein antigens, protein products of abnormal tumour cell metabolism, and mutations in single genes, their groups, or in the whole genome. These markers should more precisely identify groups of patients at the highest risk of developing cancer. Reportedly, these techniques, despite their high cost, should be considered for use in older age patients, where the most important thing is that the test result clearly indicates the risk of life threatening cancer in a short period of time.

Tertiary prevention in elderly cancer survivors

The number of cancer survivors is increasing with the development and widespread use of prevention and treatment methods. Elderly cancer survivors require rehabilitation because of the effects of cancer on health, aggressive treatment, and exacerbation of comorbidities. Cancer survival time has been increasing. In the United States, 64% of cancer survivors live for at least five years after diagnosis. About 60% of survivors are older than 65 years.

Elderly patients show better mental adaptation to cancer than younger patients. For them, cancer is often one of many health and life challenges that they must cope with. At the same time, however, elderly patients are at greater risk of physical limitations associated with pre-existing diseases that can be exacerbated because of cancer (12). The history of cancer and its treatment accelerates aging, which can be measured based on relevant molecular parameters (13). It is unclear to what extent health problems caused by cancer and its treatment depend on, or are exacerbated by, comorbidities, and how this coexistence affects morbidity and mortality. As many as 80% of elderly cancer patients have another serious comorbidity. Many of them develop clinically significant symptoms of cancer or its treatment, such as fatigue, impaired cognitive function, and peripheral neuropathy induced by chemotherapy. The latter problem impairs functioning, especially in patients with gait disorders and degenerative diseases of the osteoarticular system. Problems of "bone health" and loss of active muscle mass (sarcopenia) should attract more attention of oncologists and general practitioners during long-term use of anti-hormonal drugs. This concerns women taking for many years aromatase inhibitors as adjuvant treatment for breast cancer, as well as men taking testosterone suppressants to treat prostate cancer. Recent studies have demonstrated the effectiveness of physical activity intervention in reducing the risk of, and controlling, functional deterioration, bone health and fatigue caused by cancer and its treatment. Physical exercise and proper nutrition improve survival, even in patients with active cancer (14).

Survivorship care plan in elderly cancer survivors

American institutions, including the National Comprehensive Cancer Network, publish guidelines on the rehabilitation of cancer survivors. None of these documents is related directly to elderly convalescents. The guidelines recommend creating treatment summaries (TS) and personalized survivorship care plans (SCPs), which should be used by direct and indirect caregivers, including primary care physicians. This is done as part of the Quality Oncology Practice Initiative.

The issue of who should be responsible for the above actions remains a difficult organizational problem. Elderly cancer survivors have elderly caregivers, who are usually their life partners and have their own health problems. This implies greater dependence on community support and multi-specialist medical care. The ongoing shortage of personnel specialized in oncology and geriatrics is a challenge to public health. Given the fact that most elderly patients have an allocated primary care physician, emphasis should be placed on shifting funding and procedures to enable general practitioners to continue the oncological care plan and rehabilitation. This plan should be prepared and personalized by the oncologist in charge, supported by a geriatrician for each patient depending on the identified risks. Elements of the plan should not only aim at extending life, but also promoting a healthy life by adherence to recommendations, e.g. smoking cessation, body weight control, physical exercise, immunizations, control of blood pressure, glucose levels, obstructive pulmonary disease and/or symptoms of osteoarthritis. An additional advantage of more complex care provided by the general practitioner is related to better control of important comorbidities, because elderly cancer survivors are more likely to die as a result of their exacerbation than from cancer.

Survivorship care can be provided successfully by the general practitioner to patients who were treated for early-stage or benign cancer. Unfortunately, both patients and oncologists believe that the care of the general practitioner may be insufficient in patients with more advanced cancer. Oncologists have to build up competence, improve expertise and prepare detailed treatment summaries. In the UK, comparative studies are carried out for different survivorship care models (oncologist vs. general practitioner), depending on the severity of cancer and side effects of treatment.

The survivorship care plan (SCP) includes: a schedule of visits and monitoring tests for the early diagnosis of recurrent or progressive cancer; assessment, treatment methods and specialist consultations for persistent health effects of cancer and persistent side effects of cancer treatment, such as pain, fatigue, sexual dysfunction, and functional impairment. Patients should be assessed for the risk of secondary cancers, cardiac problems, endocrine disorders, and osteoporosis. Depression assessment scales should be included in rehabilitation plans. Economic and social problems should also be considered. Treatment summaries prepared for elderly patients should include results of overall geriatric evaluation.

SCPs are tools that must be included in the dynamic dialogue between patients and indirect caregivers, play an educational role, improve motivation and increase patient's compliance. They reduce the level of stress in patients. However, there is no evidence that they affect the quality of care or treatment outcome.

The model of care for cancer survivors needs proper attention, and this includes direct care provided by family members. They require information on the process of recovery

and how they can support the rehabilitation process. Family members have to learn how to use medical devices, supervise the patient taking medications, detect the exacerbation of side effects, and how to appropriately inform medical professionals about them. Caregivers should be supported in coping with a range of their duties (work, household responsibilities and care of the patient), as well as their physical and emotional health in difficult times when their close person is ill. Caregivers should also be educated about their important role in promoting a healthy lifestyle for their patients after recovery from cancer. These activities should be carried out under more or less intensive rehabilitation care regimes: in cooperation with a general practitioner and oncologist, only by a general practitioner, or at an oncological rehabilitation clinic (15).

Opportunities for future research

The reason for which doctors are hesitant and abstain from offering older patients a full range of treatment recognized as a standard in younger patients is the lack of relevant evidence from controlled studies in this age group. The use of all treatment modalities (surgery, radiotherapy, pharmacotherapy) is limited for fear that their aggressiveness will outweigh the potential benefit of their use. It has been argued that this approach leads to lower survival rates in older patients compared to younger ones. The International Society of Geriatric Oncology (SIOG) has been carrying out clinical studies to verify the possibility of clinical benefit for elderly patients. In 2012 several American National Institutes of Health established the Geroscience Interest Group (GSIG) to support initiatives on research related to ageing at the federal level. The Group aims to better understand the relationship between the biology of ageing and the development of chronic diseases, promote research, and coordinate the activities of the National Institutes of Health, scientific societies, industry and private institutions in this area. Better understanding of the common mechanisms behind ageing and cancer will help improve methods of preventing the development of cancer, but it is also expected to find ways to delay ageing. The effect of cancer and its treatment on ageing is another problem worth exploring. For that purpose, joint clinical studies of geriatricians and oncologists should be promoted.

Conclusions

There is a realistic perspective for an overwhelming wave of elderly with cancer in Poland as the post-war "baby boomers" approach the age with highest risk for cancer development, many of them being massively exposed to tobacco in their youth. It has been impossible even for countries with the highest development index to achieve a significant reduction in cancer mortality. Screening programmes, with all their limitations, should skilfully target the older people. Promotion of participation should encompass a comprehensive information campaign teaching wisely elder people volunteering to participate about overdiagnosis and overtreatment, false positivity of findings and other harmful phenomena that are inherent in process of secondary prophylaxis. New screening methods that identify the highest-risk conditions should be developed primarily for the use in the older population. Survivorship care plans are important for the elderly since they may reduce morbidity and mortality due to endured cancer and its treatment exacerbating comorbidities. These challenges should be considered in the debates on the priorities of next editions of the National Cancer Control Programme and the National Health Programme.

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