Cancer screening programmes

Tomáš Zima[1], Drahomíra Springer[1], Petr Kocna[1], Zdeněk Kleibl[1], Karel Hejduk[2], Ondřej Málek[2]
[1]1st Faculty of Medicine, Charles University and General University Hospital, Prague, Czech Republic
[2]National screening center, Institute of Health Information and Statistics of the Czech Republic

The primary goal of a cancer screening program is early detection of cancer in people who do not have any symptoms of the disease, to improve treatment outcomes and survival rates, or even prevent cancer from developing by finding and treating precancerous lesions.
There are cancer screening programs organized in decades as colorectal cancer (CRC) screening options, including a high-sensitivity fecal immunochemical test (FIT) in Czech Republic with an accuracy of 95%, sensitivity of 79%, and specificity of 94%. Colonoscopy every 10 years or frequently due to findings or family history is the most precise screening method. Prostate cancer screening started a few years ago. This discussion of prostate cancer screening includes the life-expectancy of men and the uncertainties, benefits, and risks associated with serum PSA testing, with or without a digital rectal exam (DRE). Czech screening program scheme combines the levels of PSA and MRI. Widely accepted breast cancer screening modalities include mammography, breast magnetic resonance imaging (MRI), breast ultrasound, and breast self-examinations. Due to breast cancer screening, most cases are diagnosed at stage I, which has a 5-year survival rate of 100%. Cervical cancer screening tests include the cervical smear, with or without HPV co-testing, and high-risk HPV (hrHPV) testing alone every 5 or 10 years. Lung cancer screening is a new one in risk population using the low-dose lung computed tomography (LDCT).
The CZECANCA panel (CZEch CAncer paNel for Clinical Application) is a diagnostic tool for cancer predisposition and improves germline genetic testing in families with cancer risk. Its main purpose is to provide a reliable and cost-effective NGS-based approach (a gene panel) for germline genetic testing, e.g pancreas, colon, ovary, breast, prostate.
Other screenings in risk populations exist (e.g. calcitonin - families with medullar cancer of the thyroid gland). Ovary cancer markers as CA 125 and HE4 are used in families with risk.
Screening programs lead to reduce mortality and incidence of cancers, mostly demonstrated in breast and colorectal cancers. The information of screening programs into public has a critical role for increasing the effectiveness of these preventive programs.
Acknowledgement: Supported by research projects the Cooperatio, MH CZ DRO VFN 64165, BBMRI - LM2023033 and funded from the EU Horizon Europe Research and Innovation Programme grant #101214318 (DISARM).