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Use of the prostate-specific antigen (PSA) test in prostate cancer screening in Quebec (report)

English summary

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Québec

This is the English summary of the guidance entitled Utilisation du dosage de l'antigène prostatique spécifique (APS) pour le dépistage du cancer de la prostate au Québec published in January 2018.

The complete version of this guidance (in French) is available on the website of INESSS in the Publications section.

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SUMMARY

Introduction

According to the Canadian Cancer Society, 4 700 new cases of prostate cancer were diagnosed in Quebec in 2016, which makes it the most common type of cancer in men. It is also the third deadliest. Prostate cancer is a heterogeneous disease, and it can be indolent or aggressive, thus causing considerable mortality and morbidity.

A prostate-specific antigen (PSA) test measures a kallikrein-like serine protease mostly produced by epithelial cells of the prostate. The PSA concentration is often high in patients with prostate cancer, but other conditions can also cause an increased PSA level. The PSA test is not considered a diagnostic test for prostate cancer, but it could detect it.

It is estimated that 90 % of cases of prostate cancer can be cured when detected and diagnosed early. Therefore, prostate cancer screening in asymptomatic individuals could reduce mortality, morbidity and the costs associated with treating advanced cancer. On the other hand, screening also has its drawbacks, such as false positives and their consequences (biopsy, overdiagnosis and overtreatment), in addition to the risks associated with the therapeutic procedures.

Despite the abundance of literature on the efficacy of PSA-based prostate cancer screening in terms of reducing mortality, the contradictory results of the main studies compel certain organizations not to recommend it as part of a screening program. In Canada, there is no such program. However, in 2013, the Collège des médecins du Québec (CMQ) recommended “considering prostate cancer screening (PSA and digital rectal examination) in certain individuals”. Given the weakness of the evidence regarding the benefits of such screening, the CMQ recommended that physicians explain to patients the risks associated with screening so that they can make an informed decision whether to go ahead with screening.

To improve consistency between the current state of knowledge and the use of the PSA test in prostate cancer screening practice observed in Quebec, INESSS is publishing a report on the use of the PSA test in prostate cancer screening. The purpose of the report is to evaluate the efficacy of the PSA test in asymptomatic men and the safety of the PSA test and the subsequent treatments in the event of a positive result, and to determine the performance parameters of the PSA test and the conditions and strategies for using it.

Methodology

The literature search was conducted in the MEDLINE (via the PubMed interface), Embase and Cochrane Library databases. The search targeted the safety and efficacy aspects and the performance parameters of the PSA test, as well as the conditions and strategies for using it. As for the efficacy of the PSA test in prostate cancer screening, only randomized clinical trials (RCTs) and systematic reviews with meta-analysis were selected. For the safety aspects, the performance parameters and the conditions and strategies for using the test, priority was given to RCTs, but observational studies were selected as well, as were systematic reviews with or without meta-analysis.

Results

Most of the scientific data presented in this report are based on five RCTs with several methodological biases, which should be taken into consideration when interpreting the results. Control group contamination and differences in the screening strategies (frequency, threshold value and patient management) are the main ones, and they limit interstudy comparison. Several observational studies were selected as well, but their methodological quality limits the integration of their results.

Efficacy of the PSA test in asymptomatic men with no personal history of prostate cancer

Five RCTs and five systematic reviews with meta-analysis were selected for evaluating the efficacy of PSA-based prostate cancer screening. However, the results of these RCTs are contradictory. Only two RCTs showed a significant reduction in prostate cancer mortality following PSA-based screening. Of the five systematic reviews with meta-analysis, only one corroborates these results. Furthermore, none of the studies selected show a benefit in terms of a decrease in overall mortality following PSA-based prostate cancer screening. Nonetheless, the body of literature selected shows that prostate cancer screening permits increased cancer detection, in addition to permitting diagnosis at an early stage.

Risks and drawbacks associated with PSA-based prostate cancer screening

The risk of a false-positive result is high, and the low positive predictive value indicates that a large proportion of men who have a biopsy after a high PSA result will not receive confirmation of prostate cancer. Most of the adverse events of the PSA test are unrelated to the blood specimen procedure. They are instead associated with the biopsy if the test is positive. Several studies, whose results are variable, have shown that the benefits in terms of reducing prostate cancer mortality are associated with a considerable number of overdiagnosed cases, principally when the PSA level at first screening is low. To limit the drawbacks and risks associated with PSA-based screening, it has been proposed that active surveillance could be a lower-risk therapeutic intervention, this without diminishing the mortality reduction benefit.

Parameters of PSA test utilization in prostate cancer screening

The literature pointing to a population in which PSA-based prostate cancer screening would be beneficial is limited. As for the age of the participants who were screened, a single RCT identified men aged 65 to 69 years as a population in which this screening would be more beneficial in terms of reducing prostate cancer mortality. However, this study's methodological limitations affect the interpretation of this result. All of the systematic reviews with meta-analysis show that screening increases the detection of prostate cancer cases, regardless of the participants' age, but only one analysis showed a decrease in prostate cancer mortality in men aged 65 to 69 years. Certain studies of lesser quality suggest that screening men in their forties could be enable to identify those at greater risk for developing prostate cancer, in addition to determining the frequency of subsequent screenings, when necessary. Furthermore, the baseline PSA level at first screening could promote the assessment of the risk of developing prostate cancer, this risk being higher when the PSA level is high. The literature review identified a family

history of prostate cancer and African-American origin as prostate cancer risk factors. However, even if men with these risk factors are more susceptible to developing prostate cancer, no data have shown that they would be at greater risk for dying from this disease. Therefore, the scientific data do not justify selective screening of these patients.

Context, conditions and strategies for judicious and sparing use of prostate cancer screening

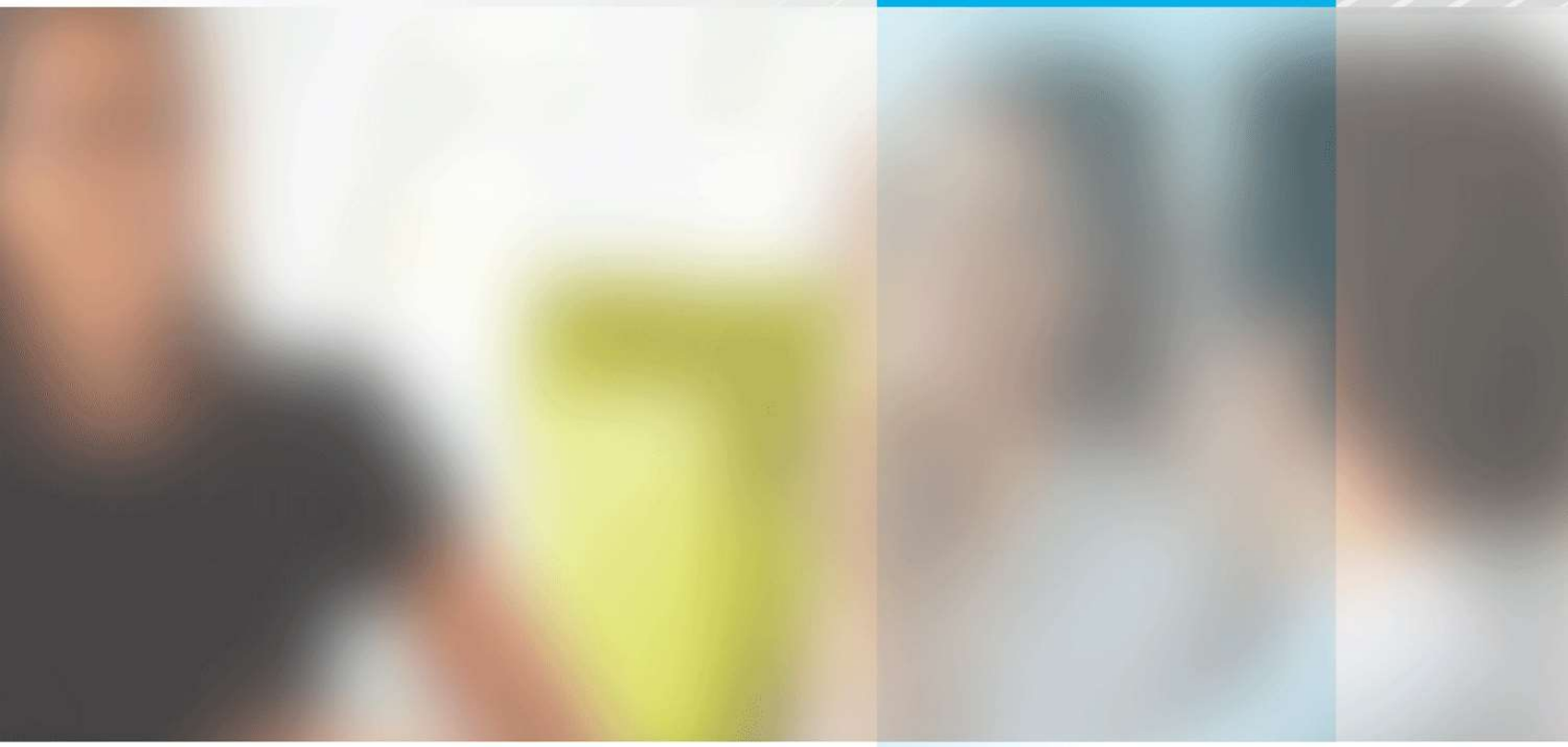
The literature on the conditions and strategies for using the PSA test in prostate cancer screening is limited. Nonetheless, for the purpose of explaining the benefits and risks associated with PSA-based screening, good-quality data have shown that using decision support aids in a shared-decision context increases the patients' knowledge of prostate cancer screening. To reduce the risks associated with PSA-based screening, cohort studies, of low quality, have shown that in the event of a high PSA test result during screening, a second test could avoid invasive diagnostic procedures if the second result contradicts the first one and therefore limit the consequences and complications associated with them.

In light of the different scientific data available, none of the international organizations automatically propose universal screening, but they do favour offering screening after informing patients of the risks and benefits associated with the PSA test. However, no consensus has been reached regarding the target population and the screening protocols.

Conclusion

The long-term benefits of PSA-based prostate cancer screening, namely, a decrease in prostate cancer mortality and a decrease in the number of diagnoses of advanced-stage cancer, are offset by the short-term drawbacks stemming from managing the disease during diagnosis and treatment. The ambivalence in the assessment of the risk-benefit balance is responsible for the uncertainty regarding PSA-based prostate cancer screening practice.

In light of this assessment, it is important to ensure that men are well informed of the benefits and risks associated with screening. For those who still want to avail themselves of this test, it is important to make judicious use of PSA-based prostate cancer screening. Therefore, INESSS does not recommend routine PSA-based prostate cancer screening. Because of a certain number of uncertainties, the PSA test should remain accessible to asymptomatic men aged 55 to 69 years with no history of cancer, if they have a life expectancy of more than 10 years.



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