Screening for urinary bladder cancer with the use of nuclear matrix protein (NMP) 22: is it feasible?

The Harvard community has made this article openly available. Please share how this access benefits you. Your story matters.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Published Version</td>
<td>doi:10.1186/1617-9625-12-S1-A6</td>
</tr>
<tr>
<td>Citable link</td>
<td><a href="http://nrs.harvard.edu/urn-3:HUL.InstRepos:12717529">http://nrs.harvard.edu/urn-3:HUL.InstRepos:12717529</a></td>
</tr>
<tr>
<td>Terms of Use</td>
<td>This article was downloaded from Harvard University’s DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at <a href="http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA">http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA</a></td>
</tr>
</tbody>
</table>
Screening for urinary bladder cancer with the use of nuclear matrix protein (NMP) 22: is it feasible?

Anastasios Stefanopoulos1,2*, Konstantinos P Economopoulos2,3

From 11th Annual Conference of the International Society for the Prevention of Tobacco Induced Diseases (ISPTID)
Athens, Greece. 9-11 December 2013

Background
Tobacco use accounts for the majority of urinary bladder cancer (UBC) cases both in men and women. It is widely accepted that smokers have increased risk of UBC [1-4]. An early diagnosis of UBC is crucial because patients with superficial UBC have much better prognosis than those with invasive UBC [1,2,4,5]. During the past years a variety of urine based markers have been introduced for screening of UBC. Nuclear matrix protein 22 (NMP22) is a nuclear protein that is accountable for chromatid regulation and cell separation during replication. The detection of NMP22 has been used from many clinical studies to evaluate the possibility of UBC screening [2,6-8]. The purpose of this review is to access the current literature in order to determine the usefulness of NMP22 in screening of UBC.

Materials and methods
A thorough search was conducted in MEDLINE using the terms urinary bladder cancer OR urinary bladder neoplasm, NMP22 and screening. The following inclusion criteria were adopted: i. studies that NMP22 was measured in high risk patients without UBC and ii. studies that NMP22 was compared between patients with known history of UBC and a control group without history of UBC. We excluded studies that NMP22 was used only for the surveillance of UBC.

Results
185 English-language articles were retrieved and 38 were included in this study. Average total sensitivity of NMP22 was 73.44 ± 15.11% and average total specificity 72.82 ± 16.27%. Positive predictive value (PPV) was 37.12 ± 26.11% and negative predictive value (NPV) was 87.47 ± 10.60%. Two studies did not report total specificity or sensitivity rates. The majority of the reports concluded that NMP22 cannot be used for screening non-invasive UBC but benefits the screening for high grade UBC in symptomatic patients. However there is no study in the literature that indicates that NMP22 detection approaches level 1 of evidence in screening for UBC. Based on the fact that the prevalence of UBC in asymptomatic high risk patients without history of UBC is low (4.0%), the diagnostic value of mass screening programs in asymptomatic patients is questionable.

Conclusions
Detection of NMP22 is a non-invasive test that can be easily applied and gives diagnostic answers very quickly especially for tobacco-induced high grade tumors. NMP22 detection cannot replace cystoscopy. It is essential, more studies to be conducted with careful selection of patients, in order to find out, if NMP22 or a combination with other markers are useful for diagnosing UBC [1,2,5].

Authors’ details
1 Medical school, National and Kapodistrian University of Athens, Athens, 115 27, Greece. 2 Society of Junior Doctors, Athens, 15123, Greece. 3 Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts, 02114, USA.

Published: 6 June 2014

References

* Correspondence: anastkstef@gmail.com
1 Medical school, National and Kapodistrian University of Athens, Athens, 115 27, Greece
Full list of author information is available at the end of the article

© 2014 Stefanopoulos and Economopoulos; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated.


doi:10.1186/1617-9625-12-S1-A6
Cite this article as: Stefanopoulos and Economopoulos: Screening for urinary bladder cancer with the use of nuclear matrix protein (NMP) 22: is it feasible? Tobacco Induced Diseases 2014 12(Suppl 1):A6.