

## *Observation*

# **Why positive results from protein test strips in urine samples in men can put the patient's health at risk due to over-treatment**

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## **Abstract**

Testing for microscopic blood traces, protein and other parameters by means of test strips has been a standard method in general medical and urological practices for years, but also in private settings. We report a potential source of error in the measurement of protein content of urine in men, which has never been addressed in the manufacturer's instructions or in other publications.

## Observation

The use of urine sticks is simple, inexpensive, and convenient. However, there is a considerable number of false positive findings of the measured value "protein", which exclusively affects men and quickly makes them victims of medical over-treatment. This can result in unnecessary administration of antibiotics, but also in burdensome and costly nephrological examinations. The lack of warning of this circumstance is remarkable. The cause in these cases is simply an admixture of prostatic secretions in the urine.<sup>2-7</sup>

Even and especially healthy male patients, but also those younger patients who suffer from chronic prostatitis<sup>10</sup>, have a physiological prostatic secretion during the day and sometimes also during the night, which does not necessarily have to leave the urethra. It can remain in the urethra for hours and be flushed out with the next urination(s). In general, there is a belief that by using midstream urine, such interfering factors can be eliminated. This is wrong. Prostate secretion, as well as that of other glands (e.g. Cowper's glands<sup>7</sup>), is of a viscous substance, sticky and can definitely also be found in midstream urine. The cause can be a short-term sexual arousal (e.g. after seeing an attractive nurse) as well as a mechanical irritation (e.g. riding the bike to the clinic). The protein fields of all urine test strips known to this research team react sensitively in these cases and discolor as if a real proteinuria were present.

We were able to obtain correctly collected data<sup>8</sup> from 20 urologically and nephrologically healthy Indian men who were divided into two groups of 10 participants each. Group 1 was asked to ejaculate every day for three days before testing. Group 2, on the other hand, was instructed to practice strict sexual abstinence. On the day of testing, the purely heterosexual group 1 was received exclusively by male personnel and provided a sample of second morning urine. Group 2, on the other hand, also entirely heterosexual, was received by attractive female nurses who were clearly visible from the waiting area at the reception desk and in close contact with the individuals in group 2. They then also provided a sample of morning urine.

These are the results for the test field "protein" in urine test strips from the manufacturer Roche:<sup>8</sup>

Group 1	Urine test strip result for protein, semi-quantitatively +/++/+++
Test person A1	neg.
Test person B1	neg.
Test person C1	(+)
Test person D1	neg.
Test person E1	neg.
Test person F1	neg.
Test person G1	neg.
Test person H1	neg.
Test person J1	neg.
Test person K1	neg.

## Group 2

Test person A2	+
Test person B2	neg.
Test person C2	++
Test person D2	neg.
Test person E2	(+)
Test person F2	(+)
Test person G2	+
Test person H2	++
Test person J2	neg.
Test person K2	neg.

Although the size of the test groups was small, they significantly support the hypothesis that latent sexual arousal in men can lead to a false positive test strip result for protein. Since this is not noted anywhere, patients are usually tested without considering this factor and are almost regularly referred directly to a nephrologist. This can lead to over-treatment of patients, and since this is not noted anywhere, male patients are usually tested without considering this factor and are almost regularly referred directly to a nephrologist. This can lead to over-treatment which makes no sense, neither from a medical nor from an economic point of view.<sup>8,5</sup>

It would be imperative to include a corresponding note in the operating instructions of the test strips of all manufacturers. In the case of a positive, isolated positive protein test field, retesting with more sensitive microalbumin test strips would have to be carried out, as these do not have a catch-all effect but react highly specifically to the presence of microalbumin.<sup>2-4</sup> It is a test that is much more sensitive as well as way more specific and therefore more reliable. However, microalbumin tests are used far too infrequently in primary and secondary care, even in the G7 countries. The only plausible explanation for this is the significantly higher purchase price of these tests, not a medical reason.<sup>5</sup> Referral to a urologist or nephrologist is the more convenient and profitable approach for practices and smaller clinics, however, definitely not in compliance with the *primum non nocere* standard.<sup>8</sup>

We therefore call on all urologists and nephrologists to consider this potential source of error. The manufacturers of such test strips should be asked to clearly identify this source of error in the instructions for use. Before testing with a cheap standard protein test strips, a man should have ejaculated in the 8 hours before, then urinated at least three times and avoided any intentional or accidental sexual arousal. Otherwise we consider the test result as not reliable and as a danger for the patient's health due to the dangers of over-treatment.

In the event of a positive result, a microalbumin test strip should be used on site (also available as microalbumin-creatinine ratio test strips) before driving the affected patient into over-diagnosis. To be on the safe side, the patient can be followed up with microalbumin-creatinine-ratio test strips after 6 and 12 weeks.

## Conflicts of interest

None.

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