
AWARENESS AND APPLICATION OF EXPRESS LABORATORY TESTS IN OUTPATIENT MEDICAL CARE

Svetlozara Kashlova

Department of Social Medicine and Healthcare Organization, Medical University “Prof. P. Stoyanov”,
Varna, Bulgaria, smile_sv@abv.bg

Lora Georgieva

Department of Social Medicine and Healthcare Organization, Medical University “Prof. P. Stoyanov”,
Varna, Bulgaria, lora@abv.bg

Abstract: Outpatient care is a key element of the health care system. It performs - diagnosis, treatment, rehabilitation and monitoring of patients, consultations, prevention, laboratory and other types of tests. Clinical and laboratory tests are extremely important for making a medical decision. They provide the necessary information for early diagnosis, control of the dynamics of the disease process and the effect of treatment, effective prevention and assessment of the degree of recovery of health and ability to work. In outpatient care, rapid laboratory tests are directed to the routine clinical laboratory. The awareness of general practitioners (GPs) and doctors from specialized outpatient care about the application of these laboratory tests is extremely important. GPs most often prescribe hematological and urine tests. A large percentage of GPs believe that their work will be significantly optimized and will improve the satisfaction of their patients if they have devices for rapid laboratory tests in their practices. With these tests, the tests can be performed in the doctors' offices at the time of the patient's first visit. This shortens the time from the request for examination to the receipt of the result. Properly selected quality laboratory tests are able to save the high costs of the health insurance system associated with late diagnosis and complicated diseases, as well as through properly selected therapy. Biochemical and hematological laboratory tests are most needed for outpatient specialists. They would use rapid tests in situations where they want to know the result of the test immediately. At the moment, the glucometer is the most used in the offices of GPs and specialists in outpatient care. It has been the most common rapid diagnostic device for years. It is used both in doctors' offices and in patients' homes. Other rapid diagnostic devices have not found such popularity. One of the reasons is poor awareness of all types of tests that can be done this way. It cannot yet be considered that an earlier, more timely and correct diagnosis, less unnecessary laboratory tests and more timely treatment are advantages that these tests provide. Express laboratory diagnostics is an acceptable alternative to traditional laboratory testing in outpatient care. The study shows that there is some but not enough information about rapid laboratory tests. The benefits that these tests offer for health care in general are still an underused resource.

Keywords: rapid laboratory tests, outpatient medical care, general practitioners, express diagnostics

1. INTRODUCTION

Outpatient medical care is a key element of the health system. Its effective functioning largely determines the efficiency of the entire health system. The performance of its functions limits the need for hospital treatment and saves financial resources [4]. In the pre-hospital medical care are performed - diagnosis, treatment, rehabilitation and monitoring of patients, consultations, prevention, laboratory and other types of tests are appointed. Clinical and laboratory tests are extremely important for making a medical decision. They provide the necessary information for early diagnosis, control of the dynamics of the disease process and the effect of treatment, effective prevention, as well as assessment of the degree of recovery of health and ability to work [11]. In outpatient care, rapid laboratory tests are directed to the routine clinical laboratory - hematology and biochemistry, urine analysis and control of oral anticoagulant therapy, which lasts 3-6 months, a year, and sometimes lifelong [6;10].

In recent decades, new technologies have increased the possibility of obtaining laboratory tests quickly and on site, next to the patient - point of care testing (POCT). POCT is increasingly expanding its application around the world and has a significant role to play in improving public health [5]. Express laboratory diagnostics is an acceptable alternative to traditional laboratory testing in outpatient care. Its application will reduce the number of unnecessary patient visits to hospitals, improve the quality of life and increase patient satisfaction [9]. It is not yet possible to assess that rapid diagnosis, quality treatment, cost and labor savings, convenience at work, simple manipulation, whole blood testing without calibration are all advantages that support the use of rapid laboratory diagnostics [7;12]. With the development of rapid diagnostics, these tests cover more and more aspects of clinical diagnostic activity in general practice - routine analysis, monitoring of therapy, self-control, screening in prevention.

Well-developed primary care is important for reducing inequalities in access to health services and therefore for achieving social justice [2;8]. In recent years, the health care system in Bulgaria has experienced a growing shortage

of medical staff. This shortage is especially relevant in outpatient care, both due to the emigration of doctors and the low interest of newly graduated doctors in primary care. This leads to an uneven distribution of outpatient medical services, difficult access for patients to medical care in remote areas, especially with poor road infrastructure or lack of public transport [1] Access to laboratories in outpatient settings is also difficult [3] due to which the tests are performed with a delay or not at all. All this shows that the health care of patients in outpatient settings can be improved if doctors know and use the possibilities of rapid laboratory diagnostics.

2. MATERIAL AND METHODS

The article examines the awareness of general practitioners (GPs) and doctors from specialized outpatient care for the use of rapid laboratory tests. The study involved 285 doctors working as GPs with the largest share of 46.7% among respondents with practices in a district town, 37.2% in a small town and 16.1% with practices in villages. The doctors working as specialists with different specialties in outpatient medical care who participated in the survey are 135. The largest part of them are with a specialty in endocrinology (19.3%), followed by a specialty in cardiology (15.6%). The data were entered and processed with the IBM SPSS Statistics 25.0 statistical package.

3. RESULTS AND DISCUSSION

Rapid laboratory tests provide fast and reliable laboratory test results. The benefits of these laboratory tests for patients and physicians are earlier, more timely and more accurate diagnosis, less unnecessary laboratory tests, more timely treatment, and a reduction or elimination of treatment that is not necessary or inappropriate.

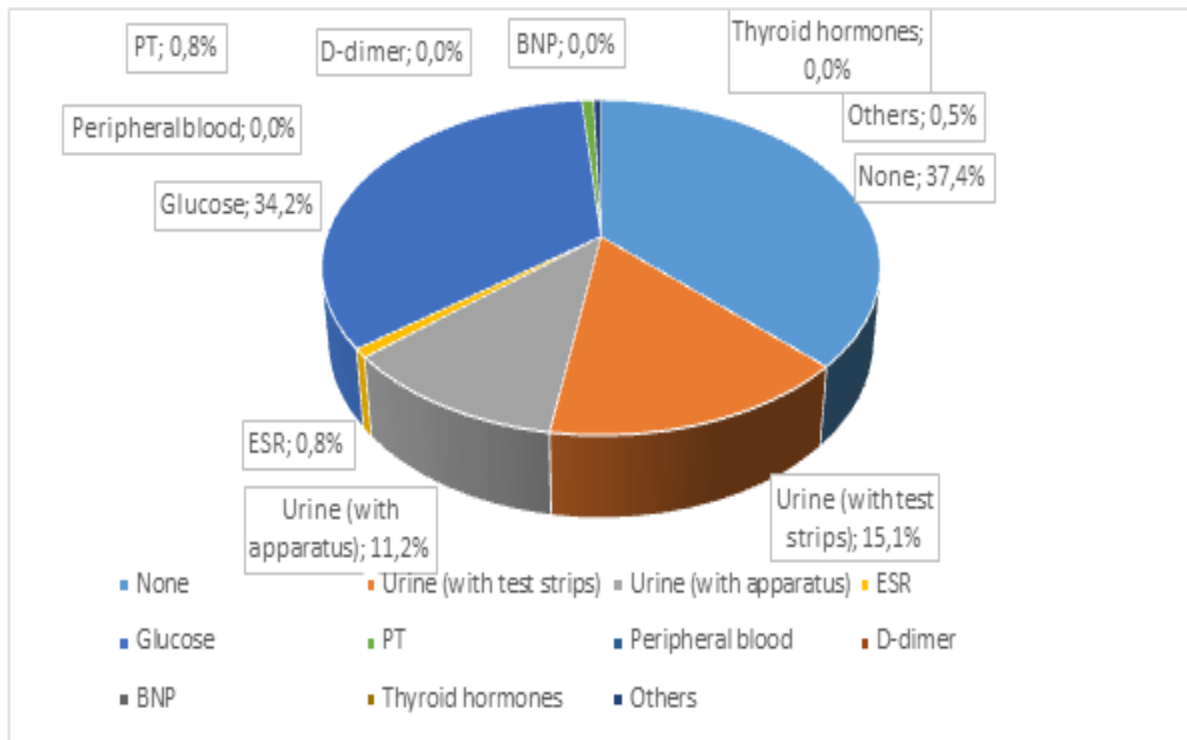
The processing of the data in our study shows that a large part of the decisions for treatment and diagnosis of doctors are influenced by the results of clinical and laboratory tests. Very often pre-hospital doctors have to do urgent tests, but they rely on the clinical laboratory, which is not always close to their offices. GPs and specialist doctors who are located in larger settlements benefit from the fact that the laboratory is located 5 km from them. In the smaller settlements and villages the nearest laboratory is located over 20 km. Regardless of whether the doctors have indicated that they have a laboratory next to them or not, almost everyone receives the laboratory result with a delay. This is because in some outpatient medical centers, even in larger settlements, there is no laboratory, but only a room where blood is taken - sampling and then taken to the appropriate laboratory. Therefore, even in cases where there is a laboratory, there is a delay in the results of laboratory tests.

Rapid laboratory tests allow the laboratory test to be returned close to the patient. These tests can be performed in the doctors' offices at the time of the patient's first visit. This shortens the time from the request for examination to the receipt of the result.

Application of express laboratory tests in GP practices

GPs encounter diseases of all organs and systems. Most often, they indicated that their practices were attended by patients with diabetes, patients in need of anticoagulant therapy, and patients with respiratory and cardiovascular diseases. The most common clinical and laboratory tests that GPs prescribe in their practices are hematological and urine tests. Blood counts and general urinalysis proved to be the most common laboratory tests they needed. Patients should go to the blood collection laboratory, get their results in a few days and return to their doctor. If the patient has diabetes should be monitored regularly - glucose, HbA_{1c}, urea and creatinine. If the patient is on anticoagulant therapy, prothrombin time - PT should be monitored regularly to avoid serious life-threatening conditions. About 90% of GPs believe that their work will be significantly optimized and will improve the satisfaction of their patients if they have glucose and prothrombin time devices in their practice. Almost all GPs report that there is a delay in the results of clinical and laboratory tests. Despite the delay in the results and all the inconveniences that follow, a higher percentage of all respondents answered that apart from blood sugar and urine they do not do other tests in their practice. As can be seen in Fig. 1, 34.2% of GPs answered that they only did blood sugar in their offices, and 15.1% performed urine tests with test strips.

Figure 1. Laboratory analyzes performed in the office of general practitioners

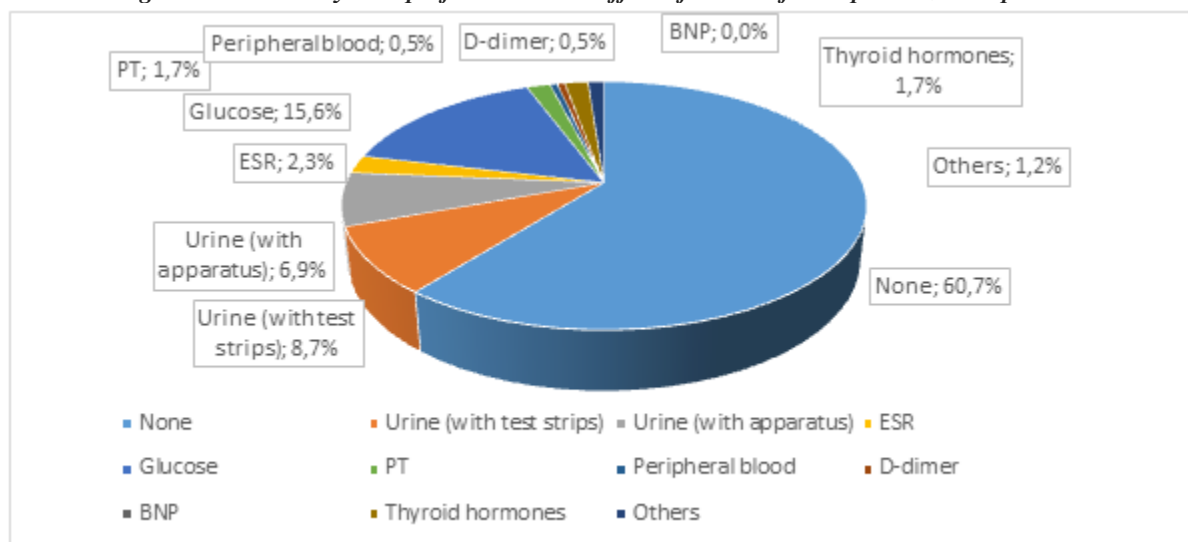


Properly selected quality laboratory tests are able to save the high costs of the health insurance system associated with late diagnosis and complicated diseases, as well as through properly selected therapy. Timely examinations can have a direct bearing even on the length of hospital stay. In order to routinely introduce them into their practices, 88.4% of GPs prefer to be trained in advance about their use - the principle of operation and interpretation of results. GPs tend to believe the results of these tests and actually use them in their practices, but most of them do not know who controls them and whether there is any control at all. According to 78.5% of all GPs surveyed, there should be external laboratory control, and 16.2% think that the laboratory doctor should exercise this control. These tests will be most suitable for GPs at home visits, in severe weather conditions, in patients with damaged veins, in patients from hard-to-reach places, in bedridden patients, in children, after discharge of patients from the hospital, in case of suspicion that the patient will not go to the laboratory, if a quick differential diagnosis is needed.

Application of the express laboratory tests in the offices of the doctors from the specialized outpatient care

Specialists in outpatient care indicate that the most necessary for them - biochemical and hematological laboratory tests. They most often prescribe hemoglobin A1c, various types of hormones and markers for the prostate. Most of the tests performed by outpatient specialists in their offices are again on blood sugar and urine tests. There is a certain variety of studies here, as some of them perform tests for prothrombin time, thyroid hormones and ESR, but this percentage is very small (Fig. 2).

Figure 2. Laboratory tests performed in the office of doctors from specialized outpatient care



Despite the small percentage that is observed, this indicates that there is some information among specialists about the variety of tests that offer this type of technology. Specialists in specialized outpatient care would use rapid tests for certain situations for which they want to know the result of the examination immediately. But they, as well as GPs, do not know how and who controls the devices for fast and on-site laboratory diagnostics. They would be more comfortable using them if they had prior training to work with them. In order to successfully introduce rapid laboratory tests in outpatient care, physicians need to be confident that their clinical decisions are based on reliable and accurate results equivalent to traditional laboratory testing.

This type of testing is a way to simplify the laboratory process so that laboratory information can reach all users easily and quickly. However, a close link with the clinical laboratory may allow quality rapid tests to be performed. The summarized data are the following most often in their GP offices and outpatient specialists use glucometers. They have been the most common devices for express diagnostics for years. They are used both in doctors' offices and in patients' homes. Other rapid diagnostic devices have not found such popularity, and the reasons for this are different. Not well informed about all the tests that can be done this way. The inability to effectively perceive what will bring real benefit, poorly organized health system.

4. CONCLUSION

Our study showed some but insufficient awareness of rapid laboratory tests. The benefits that these tests offer for health care in general are still an underused resource.

The physician may not always be able to assess whether the laboratory result will meet his or her expectations, but if the tests are performed on site in general medical practice, the GP may conduct a more in-depth interpretation of the results at the time of the patient's visit.

REFERENCES

- Bozhinova-Dimitrova, H. & Georgieva, L. (2016). Evolution and current state of primary care in Bulgarian healthcare. *Health Economics and Management*, 2, 19-23. [in Bulgarian]
- Bozhinova-Dimitrova, H. & Georgieva, L. (2017). Social aspects in the work of the general practitioner. *Varna Medical Forum*, v.6, suppl.2, 27-31. [in Bulgarian]
- Georgieva, E., Georgieva, L., Petrova, G., Kostadinova, T. & Milev, M. (2016). Collateralization of laboratory services in outpatient care in Northeast Bulgaria. *International Scientific and Practical Conference "World Science"*, 7(11), 11-13.
- Ivanov, G. & Dimitrova, D. (2012). *Introduction to general medicine and general medical practice*. Sofia: National Association of General Practitioners in Bulgaria. [in Bulgarian]
- Kashlova, S. & Georgieva, L. (2017). Development and best practices of POCT application worldwide. *Health Economics and Management*, 3, 3-7. [in Bulgarian]
- Kim, J. Y. & Lewandowski, K. (2009). Point of care testing informatics. *ClinLab Med*, 29, 449-461.

- Kost, G. J. (Ed.). (2002). *Principles and Practice of Point of Care Testing*. Philadelphia: Lippincott Williams & Wilkins.
- Parashkevova-Simeonova, B. (2016). *The general practitioner in the health system - history, development and prospects*. Stara Zagora: Academic Publishing House Thracian University. [in Bulgarian]
- Price, C. P. & St Jonh, A. (2006). *Point of Care Testing for Managers and Policymakers*. Washington, DC: AACC Press.
- Pugia, M. J. & Price, C. P. (2004). *Technology of handheld devices for point of care testing*. Washington, DC: AACC Press.
- Rosen, S. (2007). *Lateral Flow Technology and the Future of Point of Care Diagnostics*. New York: Kalorama Information.
- Smith, P. C., Araya Guerra, R., Bublitz, C., et al. (2005). Missing Clinical information during primary care visits. *JAMA*, 293(5), 565-571.