NON-INVASIVE DIAGNOSTIC SYSTEM IN THE MEDICAL DECISION SUPPORT AND SCREENING IN GASTROENTEROLOGICAL PRACTICE

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Introduction. Functional diagnostics is determinative in treatment programs for patients with gastroenterological diseases. Evaluation of digestive function is subjected to a variety of technical difficulties and practical limitations. Nowadays is considered that the ideal technique would be non-invasive, widely available, convenient and reliable. Moreover, gastrointestinal functions are closely interdependent and their simultaneous assessment is important (W. Schwizer et al, 2003).

Purpose. Development of a non-invasive diagnostic complex for gastroenterologic patients.

Method. Estimation of diagnostic possibilities of the complex fractional investigation of urine.

Results. We have developed and perfected a non-invasive diagnostic technology (V.Zheltvaj, M.Lengyel, G.Voshchepinets, L.Kirtich and others) with evaluation of digestive function on the base of urine examination, which is collected according to a certain scheme with detection of biochemical, photometric and calculated indices, allowing to receive the following information:

- function of stomach in different secretion periods;
- exocrine pancreatic function – by uroamylase level in dynamics;
- tonus of the gall-bladder, its contractive function – by the value of cholecystokinin induction coefficients;
- balance of acidic and alkaline digestive fluids – by the level and deviations of urine pH, titration acidity;
- kidneys participation in maintaining base-acid balance of the organism;
- estimation of gastro-renal correlations;

NON-INVASIVE DIAGNOSTICS OF DIGESTIVE SYSTEM FUNCTION

Patient: Bondar A.O., 2001; m.

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Period, min.	Urine volume (ml)	α -amylase (g/h l)		Cholecysto kinine coefficient	Diuresis rate, (ml/min)	Titratable urinary acidity	
		Activity	Debit			pH	mmol/l
Fasting period							
60	25,0	24	300	1,0	0,41	5,21	0,80
After meals:							
30	11,0	16	176	2,58	0,36	5,70	1,0
30	10,0	8	80	0,26	0,33	7,10	0,05
concentration - 1018							
ammonium excretion – 26.43-64.28 mmol/l							

CONCLUSION

The intensity of gastric acidity by the value of urine titration acidity is slightly elevated during the digestion period. Decompensation of acid neutralization.

The secretion function of the pancreas is on the lower limit of the normal values in the fasting period, somewhat reduced - in the period of digestion, due to both the ecbolic and hydrokinetic pancreatic function. The secretory reaction of the pancreas on the food stimulus is reduced. Hypokinetic type of biliary tract dyskinesia may be supposed.

The diuretic function of kidneys is somewhat reduced. Effective role of kidneys in maintaining the acid-base balance of the body. At the same time, the trend to increase the level of excretion of titrated acids, ammonia, low diuresis and somewhat reduced hydrokinetic function of the pancreas can indicate a tendency for developing latent metabolic acidosis.

- evaluation of latent metabolic acidosis manifestations and renal compensation mechanisms.

Conclusions. The diagnostic procedure is non-invasive, physiological, simple in performance, not expensive, has a high information value. The result is presented in a form of narrative conclusion. The method was verified using traditional gastroenterological methods of diagnostics and may be used on different levels of diagnostics, both for adults and children. It may be integrated into diagnostic complexes based on the examination of urine and used in the monitoring of the effectiveness of treatment, as a screening, in evaluation of gastroenterological side effects of oral medications etc.

The complex of methods is in accordance with the demands of contemporary indirect screening tests in gastroenterology:

- non-invasive;
- physiological;
- simple performance both for patient and for medical personnel;
- excludes expensive devices or specific reagents;
- high accuracy;
- sensitivity;
- high information value;
- actually has no contraindications.

The method was clinically verified by means of traditional gastroenterological methods of diagnostics (investigation of gastric juice, bile, pancreatic juice, X-ray examination, gastroscopy) and may be widely used for diagnosis of different levels, both in adults and children.

The method may be integrated in different diagnostic complexes, which are based on the investigation of urine and are used not only for diagnostics but also as a method of evidence based medicine.

The results of investigation for each patient is presented in a form of narrative conclusion.