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Analysis of laboratory tests results of patients submitted to a clinical screening program

Análise de resultados de exames laboratoriais de pacientes submetidos a um programa de rastreamento clínico

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ABSTRACT

Introduction: There are not studies demonstrating the major changes in biochemical tests performed in screening programs. **Objective:** Identify the results found in laboratory tests of patients submitted to medical check-up program, showing the main abnormal tests and correlating it with the age groups in which they were performed. **Method:** A cross-sectional study carried out with patients undergoing a screening service, from January to July 2015. **Results:** The study evaluated 738 patients. Form these, 53.3% were men and 46.7% were women. Body mass index (BMI) > 25 kg/m^2 was present in 43.4% of patients aged 18-39 years; 46% aged 40-59 years and 10.5% aged ≥ 60 years. Levels of fasting plasma glucose between 100-125 mg/dl were found in 10.2%. Decreased levels of high-density lipoprotein cholesterol (HDL-c) were observed in 14% and high triglyceride values in 12.7%. Changes in blood count were found in 12.6%, 7.7% of which with anemia. Among the patients, 39% of had an qualitative urine testing (QUT). Of which, 21.2% presented microscopic hematuria. Glutamic-pyruvic transaminase (GPT) was decreased in 22.5%. Urea was increased in 11%. Vitamin D insufficiency and deficiency was present in 41.2% and 19.4%, respectively. **Conclusion:** The main biochemical tests that showed changes, in sequence, were: vitamin D; qualitative urine testing; GPT; HDL-c; triglycerides; blood count; fasting glycemia and urea. The only tests that had the most abnormal rates in young adults, aged 18-39 years, were: parasitological examination of stool; decreased serum levels of urea and glutamic-oxaloacetic transaminase (GOT) and increased values of GPT.

Key words: diagnosis; screening; screening programs; preventive medicine; disease prevention.

INTRODUCTION

Regarding the disease screening, there are five criteria that define the ideal conditions for the screening of any disorder, namely: 1) disease is an important public health issue; 2) there is an asymptomatic stage; 3) there is an appropriate screening test; 4) there is a treatment available; and 5) early treatment during the asymptomatic stage improves the long-term outcome and should be more effective than the treatment of an illness diagnosed during the symptomatic phase[1].

It should be noted that several situations have been contributing to the growth of screening tests in screening programs, also known as screening or medical check-up. Among the possible factors, we highlight the aging of the Brazilian population, leading to a higher prevalence of chronic diseases[2], which, mostly, remain asymptomatic for a long period and, when diagnosed, come across complications. Moreover, lowering unemployment and increasing the income of citizens enables more comprehensive access to health and, thus, increases the demand for screening programs[3].

In the United States, more than 20% of the population is submitted annually to a periodic health assessment[4]. International organizations do not advocate the annual practice for comprehensive testing, but instead, recommend only that tests of proven preventive value should be performed in the screening programs[5, 6].

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It is believed that physicians should prioritize and resolve the various preventive services available to recommend, in order preventing harm or inappropriate interventions[7]. However, both physicians and patients, mostly, agree that annual global examinations are relevant[8, 9]. In addition, they note that general laboratory tests such as blood count, lipid profile, partial urine, blood glucose, liver and renal function, and thyroid disease should be performed as part of an annual screening[9].

Although certain biochemical tests in screening programs demonstrate proven preventive values for certain age and sex groups, it is observed that a number of complex questions remain unanswered, particularly regarding situations where a comprehensive routine examination could provide the maximum benefit. Research is critical to defining the frequency and intensity of periodic examinations required to consistently improve outcomes, as well as to demonstrate which patients could benefit most from a periodic health assessment[7, 8].

It is known that annual exams are not recommended for the majority of younger patients[5-7]. In the absence of chronic morbidities, medical appointments and periodic examinations are suggested, every three years, in apparently healthy adult patients younger than 50 years, and annually in adults aged 50 years older[7].

This fact shows the growing concern of the population regarding healthy lifestyle, prevention and early detection of diseases. However, there are no papers that demonstrate the major changes in biochemical tests performed in medical check-up programs. Therefore, this study aims to identify the results found in laboratory tests of patients who undergo screening programs, showing the main altered/changed/abnormal tests and correlating them with the age groups in which they were performed.

METHOD

This is an observational study with a cross-sectional design, in which all patients undergoing routine laboratory exams were studied in a private medical clinic in the city of Tubarão (SC), Brazil, from January to July 2015. In the study were included all patients aged 18 years or older who spontaneously sought the screening service proposed in the above mentioned clinic. On the other hand, patients who, although enrolled in the program, did not perform any of the exams were excluded.

It should be emphasized that the screening tests are proposed according to the patient's age and gender group, according to the protocol established by the clinic. For all age groups and both sexes, laboratory tests for diabetes *mellitus* (DM) and thyroid disorders screening were performed, as well as exams for liver function, renal function, blood count, serum uric acid measurement and lipid profile. It becomes different from the age of 30 years, which includes the partial urine and the parasitological stool examinations and, from the age of 40 years, in addition to those already mentioned, are performed the study of occult blood in the stool, the prostate-specific antigen test in men and the measurement of B12 and D vitamins in women.

Data were collected on two occasions. First, the patients undergoing routine laboratory exams received by the clinic a monthly list, containing the following information: name, age, sex and body mass index (BMI). With the listing of the patients in hand, the researchers had access to the computerized system of the Clinical Analysis Laboratory of the Universidade do Sul de Santa Catarina, where the results of the biochemical tests were obtained. To identify the prevalence of changes in such exams, the reference values used by the above mentioned laboratory were used.

In addition, it should be noted that in the present study it was not possible to establish the diagnosis of certain diseases that require confirmatory tests, such as DM. However, the criteria established by the American Diabetes Association (ADA) were used as cut-off points to consider changes in fasting plasma glucose (FG)[10], which included: FG levels ≥ 126 mg/dl and FG levels between 100-25 mg/dl, which would diagnose DM and pre-diabetes, respectively, since there are confirmatory tests.

Regarding the lipid profile, the present study maintained the reference values used by the above mentioned laboratory, since they follow the latest Brazilian guidelines for dyslipidemia[11], despite the recent changes established by the American Heart Association (AHA)[12], regarding the new groups of patients who are more likely to benefit from the therapy.

In addition, to classify patients with possible chronic kidney disease (CKD), this study followed the diagnostic criteria established by the guideline of the Brazilian Nephrology Society, which considers, for this purpose, a glomerular filtration rate (GFR) < 60 ml/min/1.73 m^2 for a period equal to or longer than three months, with or without renal damage. The Cockcroft-Gault formula, method of choice for the present study, can be used to estimate the GFR[13]. However, it should be pointed out that this study can not state that these patients actually had CKD, since the data were collected only in a single moment, and it is not possible to monitor these findings for a period longer than three months.

The information collected was exported to Microsoft Office Excel 2007 worksheet to public domain. Statistical analysis was performed using the Statistical Product for Service Solutions software (SPSS

for Windows v 20 Chicago, IL, USA). The quantitative variables were described by measures of central tendency and dispersion, according to the normality of the data, and the qualitative by prevalence (%) and 95% of confidence interval (CI).

The research was approved by the Research Ethics Committee, with CAAE 44192415.5.0000.5369, under opinion number 1.069.513. The reliability of the data and the confidentiality of the information were guaranteed without the identification of the participants, respecting the ethical precepts of resolution 466/2012 of the National Health Council. The data collected were analyzed and registered in the laboratory mentioned previously, after authorization provided by the guardians responsible.

RESULTS

The present study evaluated the results of laboratory tests of 738 patients, of which 393 (53.3%) were men and 345 (46.7%), were women. The age ranged from 18 to 84 years, with a mean of 41; 360 (48.7%) patients were younger than 40 years, 311 (42.1%) were 40-59 years, and 67 (9%) aged ≥ 60 years. With regard to BMI, 13 (1.8%) patients were underweight, 249 (33.7%) were eutrophic, 293 (39.7%) were overweight, and 183 (24.8%) were obese.

In **Tables 1** and **2**, the prevalence of results found in biochemical tests is observed.

Table 3 shows that the highest prevalence of changes in total cholesterol (TC) levels and in low-density lipoprotein cholesterol (LDL-c) levels occurred in the group equal to or older than 60 years, followed by those aged 40-59 years. In contrast, abnormal levels of triglycerides (TG) and high-density lipoprotein (HDL) were identified primarily in adult patients aged 40-59 years and 18-39 years.

In addition, it was observed that BMI ≥ 25 kg/m^2 was present in 43.4% of patients aged 18-39 years (young adults); in 46% aged 40-59 years (adults); and in 10.5% of those belonging to the group aged equal to or older than 60 years (elderly).

In the analysis by age group (**Table 4**), it was observed that the qualitative urine testing (QUT), including the presence of nitrite and microscopic hematuria, was mainly altered in the age group of patients equal to or older than 60 years. The abnormal FG was present in the older age group and FG as a criterion for DM (≥ 126 mg/dl), in the group 40-59 years. Moreover, with regard to the blood count, it is noticed that the changes were more frequent as the age advanced. However, anemia was more present in young adults than in those aged 40-59 years.

TABLE 1 – Prevalence of results in laboratory tests

Variables	*n* (%)	Variables	*n* (%)
FG (mg/dl)		**Urea (mg/dl)**	
< 100	640 (87.4)	Normal M: 19 to 43 and F: 15 to 36	646 (88.3)
100 to 125	75 (10.2)	Decreased	4 (0.5)
≥ 126	17 (2.3)	Increased	81 (11)
Total	732	Total	731
TSH (uUI/ml)		**GFR (mg/dl)**	
0.465 to 4.680	690 (94.1)	Normal	726 (98.6)
< 0.465	13 (1.7)	Abnormal (< 60 mg/dl)	10 (1.3)
> 4.680	30 (4.1)	Total	736
Total	733	**Uric acid (mg/dl)**	
Blood count		Normal (M: 3.5 to 8.5 and F: 2.5 to 6.2)	686 (95.1)
Normal	641 (87.3)	Decreased	11 (1.5)
Abnormal*	93 (12.6)	Increased	25 (3.4)
Total	734	Total	722
Anemia	57 (7.7)	**PSA ng/ml**	
QUT		< 4	177 (98.8)
Normal**	427 (60.9)	≥ 4	2 (1.1)
Abnormal**	274 (39)	Total	179
Total	701	**Vitamin B12 (pg/ml)**	
Nitrite	13 (1.8)	239 to 931	195 (90.6)
Hematuria	149 (21.2)	< 239	15 (6.9)
GOT (U/l)		> 931	5 (2.3)
17 to 59	693 (94)	Total	215
< 17	26 (3.5)	**Vitamin D (ng/ml)**	
> 59	18 (2.4)	Deficiency: < 20	40 (19.4)
Total	737	Insufficiency: 21 to 29	85 (41.2)
GPT (U/l)		Sufficiency: 30 to 100	81 (39.3)
21 to 72	530 (72.1)	Total	206
< 21	166 (22.5)	**Fecal occult blood**	
> 72	39 (5.3)	Normal	149 (90.3)
Total	735	Abnormal	16 (9.7)
PES		Total	165
Normal	543 (94.1)		
Abnormal	34 (5.9)		
Total	577		

**: normal or abnormal blood count regarding the presence of: leukocytosis, leukopenia, thrombocytosis or thrombocytopenia; **: normal or abnormal QUT for the presence of: glucose, albumin, ketone bodies, bilirubin, urobilinogen, nitrite, hemoglobin or leukocyte esterase in the biochemical test; or red blood cells and white blood cells in examination of urine sediment.*

FG: fasting glycemia; TSH: thyroid stimulating hormone; QUT: qualitative urine testing; GOT: glutamic-oxaloacetic transaminase; GPT: glutamic-pyruvic transaminase; PES: parasitological examination of stool; GFR: glomerular filtration rate; PSA: prostate specific antigen; M: male; F: female.

TABLE 2 – Prevalence of results according to lipid profile

Variables	*n* (%)	Variables	*n* (%)
Total cholesterol (mg/dl)		Triglycerides (mg/dl)	
Normal: < 240	685 (92.9)	Optimal: < 150	520 (70.8)
High ≥ 240	52 (7)	Borderline: 150 to 200	120 (16.3)
Total	737	High: 201 to 499	92 (12.5)
LDL-c (mg/dl)		Very high: ≥ 500	2 (0.2)
Optimal: < 100	408 (55.6)	Total	734
Desirable: 101 to 129	205 (27.9)	**HDL-c (mg/dl)**	
Borderline: 130 to 159	82 (11.1)	Desirable: > 65	174 (23.7)
High: 160 to 189	27 (3.6)	Normal: 40 or 50 to 65	457 (62.2)
Very high: ≥ 190	11 (1.5)	Decreased: < 40 M or < 50 F	103 (14)
Total	733	Total	734

LDL-c: low-density lipoprotein cholesterol; HDL-c: high-density lipoprotein cholesterol; M: male; F: female.

TABLE 3 – Frequency of changes in lipid profile in age groups

Age (years)	Variables			
	Total cholesterol ≥ 240 mg/dl	LDL ≥ 160 mg/dl	HDL < 40 mg/dl	Triglycerides ≥ 200 mg/dl
18-39	11 (3.1%)	6 (1.6%)	51 (14.2%)	42 (11.6%)
40-59	33 (10.6%)	21 (6.7%)	48 (15.4%)	45 (14.5%)
≥ 60	8 (11.9%)	11 (16.4%)	4 (6%)	7 (10.4%)

LDL: low-density lipoprotein; HDL: high-density lipoprotein.

TABLE 4 – Frequency of changes in laboratory tests in age groups

Age (years)	Variables *n* (%)			Age (years)	Variables *n* (%)	
	QUT				PES	
	Abnormal**	Nitrite+	Hematuria			Abnormal
30-39	125 (37.2)	3 (0.8)	62 (18.4)	18-39		17 (6.2)
40-59	117 (38.8)	5 (1.6)	71 (23.5)	40-59		15 (6)
≥ 60	32 (50)	5 (7.8)	16 (25)	≥ 60		2 (3.6)
	FG (mg/dl)				Urea (mg/dl)	
	100 a 125		≥ 126		Decreased	Increased
18-39	10 (2.7)		3 (0.8)	18-39	4 (1.1)	23 (6.4)
40-59	44 (14.3)		12 (3.9)	40-59	0 (0)	40 (12.9)
≥ 60	21 (31.8)		2 (3)	≥ 60	0 (0)	18 (27.6)
	TSH				Uric acid (mg/dl)	
	< 0.465	(uUI/ml)	> 4.680		Decreased	Increased
18-39	8 (2.2)		9 (2.5)	18-39	6 (1.6)	9 (2.5)
40-59	3 (0.9)		19 (6.1)	40-59	3 (1)	14 (4.6)
≥ 60	2 (2.9)		2 (2.9)	≥ 60	2 (3)	2 (3)
	Blood count				Vitamin B12 (pg/ml)	
	Abnormal*		Anemia			Def.: < 239
18-39	43 (11.9)		29 (8)	18-39		0
40-59	39 (12.6)		21 (6.7)	40-59		11 (7.4)
≥ 60	11 (16.6)		7 (10.6)	≥ 60		4 (6.3)
	GOT (U/l)				Vitamin D (ng/ml)	
	< 17		> 59		Def: < 20	Insuf: 21 to 29
18-39	17 (4.7)		7 (1.9)	18-39	0	0
40-59	6 (1.9)		10 (3.2)	40-59	23 (16.6)	60 (43.4)
≥ 60	3 (4.5)		1 (1.5)	≥ 60	14 (22.5)	24 (38.7)
	GPT (U/l)				FOB	
	< 21		> 72			Abnormal
18-39	84 (23.3)		22 (6.1)	18-39		0 (0)
40-59	63 (20.4)		17 (5.5)	40-59		11 (10)
≥ 60	19 (28.4)		0 (0)	≥ 60		5 (9.2)

**: normal or abnormal blood count regarding the presence of: leukocytosis, leukopenia, thrombocytosis or thrombocytopenia; **: normal or abnormal QUT for the presence of: glucose, albumin, ketone bodies, bilirubin, urobilinogen, nitrite, hemoglobin or leukocyte esterase in the biochemical test; or red blood cells and white blood cells in examination of urine sediment.*

QUT: qualitative urine testing; PES: parasitological examination of stool; FG: fasting glycemia; TSH: thyroid stimulating hormone; GOT: glutamic-oxaloacetic transaminase; GPT: glutamic-pyruvic transaminase; Def: deficiency; Insuf: insufficiency; FOB: fecal occult blood.

DISCUSSION

Despite the growing demand for medical check-up services[4], this research did not find literature that discusses the profile of patients seeking such programs, as well as the results identified in the set of laboratory tests performed in these services. Therefore, the findings observed in the present study were compared with other studies that sought the prevalence of abnormalities in biochemical tests singly performed.

Regarding the profile of patients in this study, it was observed that the majority was men (53.3%), showing that there is a greater concern by males to prevent possible diseases or to detect them early. In addition, the majority (48.7%) were younger than 40 years, followed by the age group 40-59 years (42.1%). The lowest demand was for patients ≥ 60 years (9%). Therefore, it is observed that young adults have been more aware to preventive medicine programs.

With regard to obesity, it is noteworthy that from 1999 to 2014 its prevalence increased among adults and young people, and therefore, it is important to monitor it in public health programs that focus on reducing or preventing overweight[14]. The US Preventive Services Task Force (USPSTF)[15] and the American Academy of Family Physicians[16] recommend screening all adults for obesity in routine medical visits.

The prevalence of obesity in this study (24.8%) is below the average estimated in the United States, since in that country it was slightly more than 36% during the period from 2011 to 2014, and was greater, in general, among adults aged 40-59 (40.2%) and elderly aged 60 years or older (37%)[14]. In this study, the BMI ≥ 25 kg/m^{2}was present mainly in the group aged 40-59 (46%) and in young adults aged 18-39 years (43.4%).

With regard to the presence of anemia, in a normal population, it would be expected that 2.5% of the individuals had decreased hemoglobin levels. Thus, iron deficiency anemia would be considered a health issue when the prevalence exceeded 5% of the population[17]. In this research it was not possible to identify the causes of anemia, although iron deficiency is the most common nutritional disorder worldwide[17, 18]. However, it is still observed that the prevalence of decreased hemoglobin concentration of 7.7% exceeds that expected for a normal population.

It was also observed that anemia was present mainly in the elderly group (10.6%), followed by patients aged 18-39 years (8%). In this age group of younger patients, this result may be considered relevant, since it is assumed that the participants of this study, in general, have better financial conditions and, consequently, better eating habits and more access to health programs.

Abnormal biochemical and liver function tests are often detected in asymptomatic patients, since the screening programs include them routinely[19]. A survey conducted in the United States conducted between 1999 and 2002 estimated that 8.9%

of patients had glutamic-pyruvic transaminase (GPT) values above normality[20]. In this study, the prevalence was 5.3% and was present mainly in the age group of 18-39 years. This work did not find literature that correlates the GPT levels with age, requiring further revisions to elucidate this issue.

Currently, there are few studies on the prevalence of microscopic hematuria[21], which is becoming more frequent in the routine exams[22]. Malignancies are detected in up to 5% of patients[23]. In an adult population, a variation in the prevalence of microscopic hematuria was estimated from 0.5%-22%[24]. Other studies showed a greater difference, around 2%-31%[25-27]. In this study, the prevalence was 21.2%, corroborating the literature data. It was also verified that the greater the age groups of the participants, the greater the prevalence of microscopic hematuria. However, this study did not find bibliographies correlating this finding with age.

In a study that used data from routine examinations of patients aged 40-74 years, a prevalence of 20.5% CKD was found, which increased with age[28]. In other studies, there was a variation from 8.3%-19.2%[29-31]. Compared with this study, the prevalence of CKD was very small. In addition, this finding was observed only in patients aged ≥ 60 years.

The studies previously mentioned defined as patients with CKD those who had GFR < 60 ml/min/1.73 m^2 for this purpose, as calculation of choice, was used the Modification of Diet in Renal Disease study equation. Thus, the discrepancies seen between the studies above mentioned may be explained by the different equations for GFR estimation used with the number of people examined and the differences in the population, including race and age, since the majority of patients in this study were younger than 40 years.

With regard to vitamin D deficiency screening, the USPSTF[32] and the American Academy of Family Physicians[33] concluded that current evidence is insufficient to assess the balance between benefits and risks in asymptomatic adults. According to data from the National Health and Nutrition Examination Survey (NHANES), in the general population of the United States, 33% identified vitamin D levels ≤ 20 ng/ml[34], and in 77%, < 30 ng/ml[35]. In this research, there was a lower prevalence of deficits. In addition, we observed that vitamin deficiency was more prevalent in women aged 40-59 years (43.4%) than in the elderly group (38.7%). In addition, regarding the thyroid dysfunctions, the USPSTF concluded that, at present, there is insufficient evidence to show the balance between the benefits and risks of screening in asymptomatic adults[36]. There are no studies that directly assess the effects of screening for thyroid dysfunction on morbidity or mortality in the general population[37, 38]. Although there are no exact estimates in the United States, it seems that screening for thyroid dysfunction by primary care providers is a common practice[39].

About 5% of women and 3% of men in the United States have subclinical hypothyroidism[40]. In the present study, very similar results are observed, since TSH levels were found increased in 4.6% of the women and 3.5% of the men. Subclinical hyperthyroidism is present in about 0.7% of the United States population[40]. In this study, the TSH levels were decreased in 1.7% of patients.

With regard to DM, type 2 affects about 8% of the US population, and 2%-3.2% of the cases are undiagnosed[41, 42]. World prevalence is estimated at 6.4% in adults, ranging from 3.8%-10.2% per region; the rates of undetected diabetes may be as high as 50% in some areas[43]. A study using NHANES data[44] found a prevalence of 9.3% of DM in the United States, where 2.8% were undiagnosed. An additional 26% of the studied population had alteration in fasting plasma glucose. The present study corroborates these findings, since a probable undiagnosed DM was observed in 2.3% of the patients. However, with regard to pre-diabetes, there was a lower prevalence of abnormal in FG.

Furthermore, in the current research, pre-diabetes was more present in the elderly (31.8%), followed by adults aged 40-59 years (14.3%). In the latter group, a greater prevalence of FG ≥ 126 mg/dl was observed among all age groups, which may be justified by the size of the sample studied and the questions related to the test, such as patient's proper fasting. These data show the importance of DM screening the older the patients are[10, 44, 45].

Regarding the lipid disorders, the USPSTF[46] stablishes that in young adults who do not have an increased risk of coronary artery disease, there are no pros or cons to routine screening. In 2002, the National cholesterol Education Program published guidelines [Adult Treatment Panel III (ATP III)], in which screening for dyslipidemia is recommended for all men and all women older than 20 years[47]. Both the USPSTF[46] and the ATP III[47] guidelines recommend using TC and HDL levels at the initial screening for lipid disorders. ATP III[47] further recommends that the measurement of TG should be part of the initial screening panel.

Based on data from NHANES III, in the general population of the United States, during 2011 to 2014, 12.1% of adults had high TC and 18.5%, had low HDL[48]. In the present study, the prevalence of both lipid disorders was lower, with 7% of patients with higher TC levels and 14% with lower HDL levels.

Also in the NHANES III, study, the percentage of patients with high TC was lower for adults aged 20-39 years (7.5%) and higher for adults aged 40-59 years (16%)[48]. In this study, it was observed that the percentage was also lower in the age group 18-39 years (3.1%), but was higher especially in patients older than 60 years (11.9%). Regarding the HDL, NHANES III identified that the percentage of its low levels was lower among those aged 60 years of age or older (15.3%) than among those aged 20-39 (19.5%) or 40-59 (19.8%)[48]. Similar results were found in the present study.

In the United States about one quarter of adults aged 20 years or older had higher triglyceride levels. The trend for the decrease was observed in the percentage of adults with higher TG, from 33.3% in the period between 2001 and 2004 to 25.1% in 2009 and 2012[49]. The prevalence was lowest in this study.

Finally, it is mentioned as limitations of this research to those inherent in the study design and those related to selection biases, since it is not possible to assume that the entire study population was asymptomatic, once such information was not collected directly from the participants.

CONCLUSION

The main biochemical tests performed in screening programs that showed changes were, in sequence, the following: vitamin D (60.6%); partial examination of urine (39%); GPT (27.8%); HDL-c (14%); TG (12.7%); blood count (12.6%); fasting plasma glucose (12.5%); and ureia (11.5%). From these, the most frequent findings were: vitamin D insufficiency (41.2%); decreased GPT values (22.5%); microscopic hematuria (21.2%); vitamin D deficiency (19.4%); decreased HDL-c levels (14%); high levels of TG (12.7%); high levels of urea (11%); fasting glucose levels between 100-125 mg/dl (10.2%); and anemia (7.7%).

In the analysis by age group, it was possible to verify that the laboratory tests that presented the highest prevalence of alteration in adults equal to or older than 60 years were: blood count; TC; LDL-c; partial examination of urine; fasting plasma glucose levels between 100 and 125 mg/dl; high serum urea levels; decreased TSH and uric acid values; vitamin D deficiency; and decreased GPT levels. The only exams that were altered mainly in young adults, aged between 18-39 years, were: parasitological examination of stool; decreased serum levels of urea and GOT; and increased GPT values.

RESUMO

Introdução: *Não há trabalhos que demonstrem quais as principais alterações de exames bioquímicos empreendidos em programas de* check-up. ***Objetivo:*** *Identificar os resultados encontrados em exames laboratoriais de pacientes submetidos a um programa de rastreamento, demonstrando os principais exames alterados e correlacionando-os com as faixas etárias em que foram realizados.* ***Método:*** *Estudo transversal efetuado com pacientes submetidos a um serviço de* screening *entre janeiro e julho de 2015.* ***Resultados:*** *O estudo avaliou 738 pacientes. Destes, 53,3% eram homens e 46,7%, mulheres. O índice de massa corporal (IMC) > 25 kg/m² esteve presente em 43,4% dos pacientes com 18 a 39 anos, em 46% com 40 a 59 anos e em 10,5% com idade ≥ 60 anos. Níveis de glicose plasmática de jejum entre 100 e 125 mg/dl foram evidenciados em 10,2%. Níveis diminuídos de colesterol da lipoproteína de alta densidade (HDL-c) foram observados em 14% e valores elevados de triglicerídeos, em 12,7%. Alteração no hemograma foi encontrada em 12,6%, sendo 7,7% com anemia. Dos pacientes, 39% tinham um exame qualitativo de urina (EQU) alterado. Destes, 21,2% apresentaram hematúria microscópica. Transaminase glutâmico pirúvica (TGP) esteve diminuída em 22,5%. A ureia esteve elevada em 11%. Insuficiência e deficiência de vitamina D estiveram presentes em 41,2% e 19,4%, respectivamente.* ***Conclusão:*** *Os principais exames bioquímicos que apresentaram alterações, em sequência, foram: vitamina D, exame parcial de urina, TGP, HDL-c, triglicerídeos, hemograma, glicemia de jejum e ureia. Os únicos exames que tiveram taxas mais alteradas nos adultos jovens com idade entre 18 e 39 anos foram: exame parasitológico de fezes, níveis séricos diminuídos de ureia e de transaminase glutâmico oxalacética (TGO) e valores aumentados de TGP.*

Unitermos: *diagnóstico; triagem; programas de rastreamento; medicina preventiva; prevenção de doenças.*

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