Abstract
According to the results of studying the ranges of diagnostic measures among 75 patients with eczema, primary health care quality was assessed. The adequacy/completeness of clinical and anamnestic examination of patients with eczema by general family medicine physicians was at the level of (56.5 ± 59.8) % being characterized by the underestimation of the state of skin derivatives (microelementosis, vitamin deficiency) in (86.7 ± 3.9) % of patients; the constitutional and biological markers, visceral and functional markers of undifferentiated connective tissue dysplasia in (74.7 ± 5.0) % and (74.7 ± 5.0) % of patients, respectively; the influence of unfavorable regional environmental factors, living conditions and professional activity, clinical and morphological evaluation of rash in (49.3 ± 5.8) % of patients. According to the generalized quality index, the adequacy/completeness of clinical and laboratory examination of patients with eczema was at the level of (58.4 ± 63.4) % being characterized by a low level of examinations aimed at the detection of possible disorders of microelement homeostasis and comorbidity. According to the generalized quality index, the adequacy/completeness of clinical and instrumental examination of patients with eczema was at the level of 66.5 being characterized by a low level of instrumental diagnostics of autonomic homeostasis state, densitometry, anesthesiometry, imaging study of the joints.

Keywords
general family medicine; quality assessment; diagnostic process; chronic dermatoses; eczema

Problem statement and analysis of the latest research
Modern trends in the development of general family medicine (GFM) as a scientific specialty and practical activity determine the need for developing simple and accessible at the stage of primary healthcare (PHC) measures for diagnosing and prognosing an exacerbated clinical course of chronic dermatoses (CD) with the use of clinical and anamnestic measures (CAM), clinical and laboratory measures (CLM), clinical and instrumental measures (CIM) by a GFM physician [3, 10, 11]. This problem is especially relevant due to subsequent reform of the field on the basis of GFM principles, as well as the need for care coordination for patients with eczema and interdisciplinary cooperation [6, 11, 12]. The aspects of the collaboration between GFM physicians and dermatovenerologists such as examination phasing, forms and methods of long-term observation of patients with eczema, family-level preventive activities carried out by GFM physicians to ensure the psychosocial well-being of patients with eczema have not been sufficiently studied yet [7, 8, 9]. Therefore, the development of methods for quality assessment of the diagnostic, therapeutic and prophylactic processes when providing care to patients with eczema at the stage of PHC is of special importance [3, 6].

The objective of the research was to study the range and adequacy of diagnostic procedures carried out by primary care physicians when providing care to patients with eczema considering anamnestic, laboratory and instrumental components.

1. Materials and Methods
The analysis of diagnostic procedure adequacy at the stage of PHC was conducted in 75 patients with eczema depending on its severity considering clinical and anamnestic, laboratory and instrumental components of the diagnostic process. To study the frequency of using certain diagnostic procedures, there was developed an expert evaluation record which included the data from the outpatient medical record (f.025/o) and/or medical history (f.003/o) of patients with CD. Considering the process of ensuring quality diagnostic process as a multicomponent system (clinical and anamnestic, clinical and laboratory, clinical and instrumental components), we have determined the choice of the methods of systematic approach, assessment and analysis. According to the theory and practice of multicomponent system functioning, the level of the system (in our case diagnostic one) arrangement is of great importance [1]. Therefore, to obtain an integral assessment of
the diagnostic process quality, there were used the indicators of the arrangement of diagnostic complex system; the entropy index \( (h, \text{bit}) \) of each indicator was calculated for each group of patients. The entropic value of the quality index \( (h, \text{bit}) \) was determined by the formula \( h=-k \times \log_2 k \), where \( k \) was the frequency of using a specific type of diagnostic procedures, while the value of the generalized quality index \( (H, \text{bit}) \) was calculated by the formula \( H=n(-h_1+h_2+h_3+...+h_n) \), where \( n \) was the number of assessment indicators in the corresponding diagnostic component [1, 4, 5]. Clinical and statistical, clinical and informational methods, namely: anamnestic quantitative assessment, variational statistics, probability distribution of clinical signs with the assessment of the reliability of the results obtained were used when conducting statistical analysis [4].

### 2. Results and Discussion

Seventy-five patients with eczema were examined by primary care physicians: anamnestic data for the detection of the typical complaints (CAM1) were collected in \((69.3 \pm 5.3)\% \) of patients only; \((73.7 \pm 7.1)\% \) of patients with mild eczema and \((51.1 \pm 7.8)\% \) of patients with moderate eczema were interviewed to take anamnesis related to seasonal eczema exacerbations (CAM2), \( p < 0.05 \); anamnesis related to family history of CD (CAM3) was taken from \((50.7 \pm 5.8)\% \) of patients \((42.1 \pm 8.0)\% \) of patients with mild eczema and \((46.8 \pm 8.1)\% \) of patients with moderate eczema, \( p > 0.05 \) (Table 1). Among \((72.0 \pm 5.2)\% \) of patients with eczema, stress-inducing factors were determined/analyzed (CAM4) and the psychological state was assessed in \((76.3 \pm 6.9)\% \) of patients with mild eczema and \((53.2 \pm 7.7)\% \) of patients with moderate eczema, \( p < 0.05 \), while clinical and morphological evaluation of rash (according to IASI system; CAM5) was performed in \((50.7 \pm 5.8)\% \) of patients only.

Clinical evaluation of skin derivatives to identify the presence/absence of microelementosis or vitamin deficiency signs was performed in \((13.3 \pm 3.9)\% \) of patients only; there was observed an insufficient clinical and anamnestic evaluation of this sign (CAM6) among patients with both moderate and mild eczema - \((12.8 \pm 6.1)\% \) and \((10.5 \pm 5.0)\% \), respectively, \( p > 0.05 \). During clinical and anamnestic study, the analysis of elimination behavior related to risk factors triggering the exacerbation of eczema clinical course (CAM7) was conducted in \((25.3 \pm 5.0)\% \) of patients; therapeutic and prognostic indicators, namely the constitutional and biological markers (CBM; CAM8), visceral and functional markers (VFM; CAM9) were registered in \((25.3 \pm 5.0)\% \) of patients; the registration frequency did not depend on CD severity. At the same time, the analysis of potential influence of regional environmental factors (REF; CAM10) on the patient’s well-being and the clinical course of the disease was conducted significantly more often – in \((50.7 \pm 5.8)\% \) of cases.

The analysis of using laboratory diagnostics among patients with eczema at the stage of PHC was conducted depending on disease severity

Seventy-five patients with eczema were examined by primary care physicians: in \((96.4 \pm 1.3)\% \) of cases, the Wassermann test/the microprecipitation test (CLM1) were done; a complete blood count (CLM2; including the ESR and platelet count) was used in the absolute majority of cases \((79.1 \pm 5.4)\% \) - \((87.2 \pm 8.0)\% \) of patients with moderate eczema and \((73.0 \pm 5.5)\% \) of patients with mild eczema, \( p > 0.05 \) (Table 2).

A C-reactive protein test (CLM3) was done in \((68.2 \pm 5.3)\% \) of cases \((58.7 \pm 7.8)\% \) of patients with mild eczema and \((80.0 \pm 7.1)\% \) of patients with moderate eczema, \( p < 0.05 \). Serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) (CLM4) were determined biochemically in \((53.6 \pm 5.8)\% \) of cases \((47.6 \pm 8.1)\% \) of patients with mild eczema and \((61.7 \pm 8.1)\% \) of patients with moderate eczema, \( p > 0.05 \). Clinical and laboratory examination of patients with moderate eczema included the determination of blood glucose (CLM5) and lipid profile (CLM6) more often. Clinical and laboratory examination of \((7.3 \pm 3.4)\% \) of patients with mild eczema included the study of blood serum micro- and macroelements/hair/urine (the results were almost not taken into consideration).

The analysis of the range of instrumental diagnostic procedures at the stage of providing PHC to patients with eczema depending on disease severity allowed us to determine the diagnostic adequacy of clinical and instrumental component (Table 3).

Among 75 patients with eczema being examined by primary care physicians, fluorography/chest X-ray (CIM1) were used in all the cases, while diagnostics of dental health or ENT organs with subsequent determination of treatment strategy were applied in \((84.08 \pm 4.2)\% \) of cases \((91.9 \pm 4.5)\% \) of patients with moderate eczema and \((76.3 \pm 6.9)\% \) of patients with mild eczema, \( p < 0.05 \).

The frequency of using 2 X-ray projection or ultrasound examination of the joints (CIM1) averaged \((18.7 \pm 4.5)\% \). The electrocardiogram (ECG), blood pressure (BP) control and personalized cardiovascular risk (CVR) assessment (CIM4) were used in \((73.3 \pm 5.1)\% \) of cases - \((63.2 \pm 7.8)\% \) of patients with mild eczema and \((83.8 \pm 6.1)\% \) of patients with moderate eczema, \( p < 0.05 \).

Complete physical examination of patients with eczema included imaging study of the gallbladder and bile ducts (CIM5) in \((26.7 \pm 5.1)\% \) of cases; the frequency of using these examinations did not depend on disease severity. Imaging study of the kidneys (CIM6) was performed in \((28.0 \pm 5.2)\% \) of cases. The methods such as bone densitometry (X-ray, ultrasound examination) (CIM7), pulmonary function test (CIM8), autonomic status assessment (CIM9) and pain threshold assessment (CIM10) being predictively and diagnostically significant were more rarely used (at the level of 15.0% and less) during clinical and instrumental diagnostics of patients with mild eczema.
Table 1. Range of diagnostic procedures at the stage of providing PHC to patients with eczema depending on disease severity: clinical and anamnestic component of diagnostic adequacy

| Clinical and anamnestic diagnostic measures and corresponding qualimetric coefficients | Group of patients with eczema (L30) | mild eczema | moderate eczema | Total (nE=75) |
|---------------------------------------------------------------------------------------|--------------------------------------|-------------|-----------------|--------------|
| CAM₁: anamnestic detection of the typical complaints                                   | h, bit P±m, %                       | h, bit P±m, % | h, bit P±m, %   |              |
| CAM₂: anamnesis (seasonal exacerbations, trigger factors)                              | 0.325 73.7±7.1 a                     | 0.495 51.1±7.8 | 0.366 69.3±5.3  |              |
| CAM₃: assessment of family history of CD                                              | 0.525 42.1±8.0                       | 0.473 46.8±8.1 | 0.468 50.7±5.8  |              |
| CAM₄: assessment of the psychological state, analysis of stress-inducing factors       | 0.298 76.3±6.9 a                     | 0.484 53.2±7.7 | 0.341 72.0±5.2  |              |
| CAM₅: clinical and morphological evaluation of rash (IASI)                            | 0.519 44.7±8.1                       | 0.519 44.7±8.1 | 0.497 50.7±5.8  |              |
| CAM₆: clinical evaluation of skin derivatives (microelementosis, vitamin deficiency)  | 0.342 10.5±5.0                       | 0.379 12.8±6.1 | 0.388 13.3±3.9  |              |
| CAM₇: analysis of elimination behavior and CD clinical course                          | 0.525 31.6±7.5                       | 0.52 29.8±8.0  | 0.53 34.7±5.5   |              |
| CAM₈: CBM registration                                                                | 0.492 21.1±6.6                       | 0.475 23.4±7.5 | 0.502 25.3±5.0  |              |
| CAM₉: VFM registration                                                                | 0.473 23.7±6.9                       | 0.49 21.3±7.3  | 0.502 25.3±5.0  |              |
| CAM₁₀: analysis of the influence of REF, living conditions and profession             | 0.525 42.1±8.0                       | 0.513 46.8±8.1 | 0.497 50.7±5.8  |              |
| HCAM, bit                                                                             | 5.975 -                               | 5.651 -      | 5.909 -         |              |

Notes.

a - significant difference in the frequency of usage depending on dermatosis severity;

h - entropic value of the indicator, bit;

H<sub>CAM</sub> - quality indicator of clinical and anamnestic examination, bit.

3. Conclusions

1. According to the generalized quality index, the adequacy/completeness of clinical and anamnestic examination of patients with eczema by GFM physicians was at the level of (56.5±59.8)% being characterized by the underestimation of the state of skin derivatives (microelementosis, vitamin deficiency) in (86.7±3.9)% of patients; the CBM and VFM of undifferentiated connective tissue dysplasia in (74.7±5.0)% and (74.7±5.0)% of patients, respectively; the influence of unfavorable REF, living conditions and professional activity, clinical and morphological evaluation of rash in (49.3±5.8)% of patients.

2. According to the generalized quality index, the adequacy/completeness of clinical and laboratory examination of patients with eczema at the stage of PHC was at the level of (58.4±63.4)% being characterized by a low level of examinations aimed at the detection of possible disorders of microelement homeostasis and comorbidity.

3. According to the generalized quality index, the adequacy/completeness of clinical and instrumental examination of patients with eczema at the stage of PHC was at the level of 66.5 being characterized by a low level of instrumental diagnostics of autonomic homeostasis state, densitometry, anesthesiometry, imaging study of the joints.

4. Depending on eczema severity, there were differences in the ranges of diagnostic measures and, accordingly, the indicators of diagnostic process quality: anamnestic and laboratory examinations were more often used when examining patients with mild eczema; laboratory examinations were more commonly used when examining patients with moderate eczema; instrumental diagnostics was applied equally frequently.

4. Prospects of Further Researches

The study of the influence of diagnostic process quality on the clinical course of chronic eczema at the stage of PHC and the characteristics of the formation of long-term relationships between a patient with eczema and a GFM physician is promising.
Table 2. Range of diagnostic procedures at the stage of providing PHC to patients with eczema depending on disease severity: laboratory component of diagnostic adequacy

| Clinical and anamnestic diagnostic measures and corresponding qualimetric coefficients | Group of patients with eczema (L30) | Mild eczema | Moderate eczema | Total (nE=75) |
|---|---|---|---|---|
| | h, bit | P±m, % | h, bit | P±m, % | h, bit | P±m, % |
| CLM₁: the microprecipitation test/the Wassermann test | 0.045 | 96.8±2.6 | 0.06 | 95.7±2.7 | 0.051 | 96.4±1.3 |
| CLM₂: complete blood count | 0.331 | 73.0±5.5 | 0.172 | 87.2±8.0 | 0.268 | 79.1±5.4 |
| CLM₃: C-reactive protein test | 0.451 | 58.7±7.8 | 0.248 | 80.9±7.1 | 0.377 | 68.2±5.3 |
| CLM₄: ALT and AST | 0.51 | 47.6±8.1 | 0.43 | 61.7±8.1 | 0.482 | 53.6±5.8 |
| CLM₅: blood glucose | 0.375 | 34.9±7.5 | 0.347 | 66.0±5.1 | 0.344 | 48.2±4.7 |
| CLM₆: lipid profile (total cholesterol, triglycerides lipoproteins) | 0.515 | 46.0±8.1 | 0.505 | 48.9±8.1 | 0.511 | 47.3±5.4 |
| CLM₇: allergen skin tests | 0.526 | 31.7±7.8 | 0.53 | 38.3±8.1 | 0.53 | 34.5±5.8 |
| CLM₈: total bilirubin | 0.522 | 30.2±6.9 | 0.459 | 57.4±8.1 | 0.526 | 41.8±5.4 |
| CLM₉: immunologic study | 0.529 | 39.7±8.7 | 0.513 | 46.8±8.1 | 0.524 | 42.7±5.8 |
| CLM₁₀: study of blood serum micro- and macroelements | 0.209 | 48.3±6.7 | 0.344 | 10.6±5.6 | 0.275 | 7.3±3.4 |
| H_{CLM}, bit | 5.839 | - | 6.344 | - | 5.949 | - |

Notes.
- a - significant difference in the frequency of usage depending on dermatosis severity;
- h - entropic value of the indicator, bit;
- H_{CLM} - quality indicator of clinical and laboratory examination, bit.

Table 3. Range of diagnostic procedures at the stage of providing PHC to patients with eczema depending on disease severity: clinical and instrumental component of diagnostic adequacy

| Clinical and anamnestic diagnostic measures and corresponding qualimetric coefficients | Group of patients with eczema (L30) | Mild eczema | Moderate eczema | Total (nE=75) |
|---|---|---|---|---|
| | h, bit | P±m, % | h, bit | P±m, % | h, bit | P±m, % |
| CIM₁: fluorography/chest X-ray | 0 | 100 | 0 | 100 | 0 | 100 |
| CIM₂: diagnostics of dental health/ diagnostics of ENT organs | 0.298 | 76.3±6.9 | 0.112 | 91.9±4.5 | 0.211 | 84.0±4.2 |
| CIM₃: 2 X-ray projection/ultrasound examination of the joints | 0.42 | 15.8±5.9 | 0.478 | 21.6±6.8 | 0.452 | 18.7±4.5 |
| CIM₄: ECG, BP control and CVR assessment | 0.419 | 63.2±7.8 | 0.214 | 83.8±6.1 | 0.328 | 73.3±5.1 |
| CIM₅: imaging study of the gallbladder and bile ducts | 0.492 | 23.7±6.9 | 0.52 | 29.7±7.5 | 0.509 | 26.7±5.1 |
| CIM₆: imaging study of the kidneys and the urinary system | 0.518 | 28.9±7.7 | 0.51 | 27.0±7.3 | 0.514 | 28.0±5.2 |
| CIM₇: bone densitometry (X-ray, ultrasound examination) | 0.289 | 7.9±4.4 | 0.454 | 18.9±6.4 | 0.388 | 13.3±3.9 |
| CIM₈: pulmonary function test | 0.342 | 10.5±5.0 | 0.347 | 10.8±5.1 | 0.344 | 10.7±3.6 |
| CIM₉: instrumental/tabular autonomic status assessment | 0.385 | 13.2±5.5 | 0.478 | 21.6±6.7 | 0.438 | 17.3±4.4 |
| CIM₁₀: pain threshold assessment (anesthesiometry) | 0.289 | 7.9±4.4 | 0.347 | 10.8±4.5 | 0.319 | 9.3±3.4 |
| HCIM, bit | 6.548 | - | 6.54 | - | 6.496 | - |

Notes.
- a - significant difference in the frequency of usage depending on dermatosis severity;
- h - entropic value of the indicator, bit;
- HCIM - quality indicator of clinical and instrumental examination, bit.
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