

Epidemiology of urticaria in Poland – nationally representative survey results

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Abstract

Introduction: The prevalence of urticaria is 15–20%. Women are twice as likely to be affected.

Aim: To present the epidemiology of urticaria and angioedema in Poland.

Material and methods: A questionnaire-based survey was conducted on a representative group of 4,897 individuals, aged 15–74 years.

Results: A total of 11.2% of respondents reported at least one episode of urticaria symptoms in their life, and the frequency was higher in females (OR = 1.46; $p < 0.001$). Single episodes accounted for 34.8%, while repeated episodes accounted for 65.2%. Acute urticaria was observed in 10.6% (more frequent in females; OR = 1.41; $p < 0.001$), chronic in 0.6%. Median age of the first episode was 15 years. Angioedema was observed in 3.2%. The last episode of urticaria symptoms and/or angioedema occurred within the previous week in 0.7% of subjects, the last month in 1%, and the last year in 2.2%. 8.8% had experienced urticaria symptoms or angioedema over 1 year prior to the survey. The impact of urticaria symptoms on patients' daily activities was rated with 3.8 points on a scale of 0–10. In addition, chronic urticaria was rated 6.5, and acute urticaria 3.6. Angioedema and urticaria had a negative impact of 5.7 points.

Conclusions: Urticaria and angioedema are serious health problems in Poland, although their prevalence is below the mean rate for the global population. Females are more likely to suffer from these diseases. People affected by urticaria most frequently report contact with plants and substances, insect bites/stings, and food as the provoking factors.

Key words: acute urticaria, angioedema, chronic urticaria, epidemiology, questionnaire-based survey.

Introduction

Urticaria is a very common skin disease characterized by a rapid onset of itchy wheals and in 40% of cases is accompanied by angioedema [1, 2]. Classical urticarial wheals resolve within a period of 24 h. Urticaria constitutes a heterogeneous group of variants, classified as types and subtypes. According to the Urticaria Consensus Meeting, urticaria is classified as acute (not exceeding 6 weeks) or chronic (more than 6 weeks). Chronic urticaria is further divided into spontaneous and induced [2]. Furthermore, two variants of chronic spontaneous urticaria are distinguished: chronic continuous urticaria (wheals appear and thereafter disappear every day or almost every

day) and chronic recurrent urticaria (with symptom-free periods, lasting for a few days or weeks) [1, 3].

There are no nation-wide data available on the prevalence of urticaria or angioedema in the general Polish population. Previous studies were based on a different methodology and included a selected group and/or a particular geographical area. Most epidemiological estimates on Poland are based on data from other countries and/or regional studies.

Urticaria affects 15–20% of the world population. In Europe, the incidence of chronic spontaneous urticaria is 8–10%. Cases of chronic spontaneous urticaria of unknown etiology constitute a further 0.1–3% of diagnoses

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[4, 5]. Females are nearly twice as frequently affected as males, and the peak incidence of chronic spontaneous urticaria falls between 20 and 40 years of age [4, 6–12]. There is a significant positive correlation between the severity of clinical signs and symptoms of urticaria, and duration of the disease [9].

Angioedema is characterized by edema of the subcutaneous or submucosal tissue resulting from dilatation of blood vessels and their increased permeability. Its clinical features consist of rapid onset, significant severity, pain sensation within the area of skin lesions, commonly affected mucous membranes, and slower regression in comparison to urticarial wheals (up to 72 h) [3]. In approximately 33–67% of chronic spontaneous urticarial cases, urticarial wheals and angioedema appear simultaneously, as compared to 29–65% reporting isolated wheals, and in 1–13% only angioedema [4, 5, 10, 13].

Worldwide epidemiological studies on urticaria may be divided into two main categories: outpatient based studies and questionnaire-based surveys. There are also combined protocols used in the trials, such as outpatient studies supplemented by questionnaire-based surveys (e.g. those concerning the quality of life of patients with urticaria) and vice versa, being performed in order to verify the preliminary diagnoses. Epidemiological data on urticaria may also be obtained from various medical registers – however, these are “nonreactive studies” – carried out without participation of the study individuals and therefore of different characteristics. There are reliable and specifically constructed questionnaires used for epidemiological studies on urticaria available in the worldwide literature [14–16].

Aim

However, the primary aim of this study is to present the epidemiology of urticaria and angioedema in the Polish population and to analyze the factor/s possibly inducing urticarial episodes. Additionally, assessment of the negative impact of urticaria or angioedema for the respondent is also evaluated.

Material and methods

The study on Epidemiology of Urticaria in Poland (EUP) was a questionnaire-based survey. A total of 19 closed and semi-closed questions (developed for purposes of the study) were implemented as the basic research tool. Survey questions focused on the occurrence of urticaria and angioedema episodes in studied individuals (Appendices 1 and 2). Questions were based on existing knowledge about the symptoms of urticaria and experience from other similar epidemiological studies. The respondents were presented with the most common examples of urticaria and angioedema (two separate cards with 8 pictures of urticaria and 5 pictures of angioedema) in order to clarify signs and symptoms of the disease, and make their identification easier. Additionally, the questionnaire included definitions of urticaria and angioedema, which were verbally presented to each respondent.

We classified urticaria according to the Urticaria Consensus Meeting [2]. The negative impact of urticaria on patients' quality of life was measured by a self-assessment question. It contained a simple scale, where 0

Table 1. Comparison of the structure of the conducted sample ($N = 4897$) before weighting (raw data) and after weighting with regard to the population divided into age and sex groups (data from CSO: Central Statistical Office of Poland of 31 Dec 2013). Data are shown as percentages

Age [years]	Raw data		Weighted data		Population (CSO)	
	Men	Women	Men	Women	Men	Women
15–19	3.7	3.6	3.6	3.6	3.6	3.4
20–24	4.2	4.2	4.2	4.2	4.4	4.2
25–29	4.7	5.7	4.7	5.4	5.1	5.0
30–34	5.4	5.2	5.4	5.0	5.4	5.3
35–39	4.6	4.8	4.5	4.9	5.1	4.9
40–44	4.3	4.0	4.4	4.2	4.3	4.2
45–49	3.7	5.0	3.7	5.0	3.9	3.9
50–54	4.3	3.7	4.4	3.7	4.3	4.4
55–59	4.6	4.9	4.7	4.8	4.7	5.1
60–64	4.0	5.5	4.1	5.6	4.0	4.7
65–69	3.4	3.0	3.5	3.0	2.6	3.3
70–74	1.4	1.9	1.5	2.0	1.7	2.5
Total	48.5	51.5	48.6	51.4	49.1	50.9

means no negative effect and 10 is the maximum negative impact.

The main part of the study was preceded by a pilot survey (106 individuals in 4 centers), primarily for validation of the questions. As many as 52 individuals with urticaria and 54 without signs and symptoms of urticaria (27 healthy individuals, 27 with other skin diseases) were selected for the pilot study (purposive sampling).

The EUP was carried out all over Poland by two independent research centers (TNS and Millward Brown). The main survey was conducted by the pollsters with the computer-assisted personal interviewing (CAPI) method at respondents' homes during July and August, 2014. The random-quota method was used for sampling from the general population (adults). There were no inclusion criteria except age. In total, 5,017 individuals participated in the study (4,897 individuals aged 15–74 years were qualified for further analyses; 120 individuals aged 75 and more were excluded because of the age criteria). The data were weighted to the population structure (Table 1). Results were considered to be statistically significant at $p < 0.05$. According to the guidelines of the Bioethics Committee of the Medical University of Warsaw non-invasive studies (including surveys) do not require ethics approval.

Results

Lifetime occurrence of at least one episode of urticaria symptoms was reported by 11.2% of respondents. There was a statistically significant difference related to gender ($p < 0.001$). Females declared at least once in life appearance of urticaria symptoms more frequently than males (OR = 1.46; 95% CI: 1.22–1.75%). Age (grouped in 10-year categories) did not influence the prevalence of declared urticaria symptoms ($p = 0.729$). Similarly, there was no difference in relation to the place of living (urban vs. rural area) ($p = 0.963$). Detailed results are presented in Table 2.

Among individuals reporting urticaria symptoms, 34.8% (3.9% of all study subjects) experienced one single episode, and 65.2% (7.3% of all study subjects) reported many episodes. Gender was not associated with these results ($p = 0.082$). Among individuals reporting more than one episode of urticaria symptoms, 41.1% experienced urticarial wheals less than once a year, 17.2% once a year, 30.4% several times a year, 7.6% several times a month, and 3.7% several times a week or every day. There was no statistically significant difference in relation to gender ($p = 0.236$).

Acute spontaneous urticaria (symptoms lasting for less than 6 weeks) was reported by 10.6% of respondents (95% CI: 9.8–11.5%), 9.0% males and 12.2% females ($p < 0.001$). A total of 28 individuals (0.6%; 95% CI: 0.4–0.8%) reported suffering from chronic spontaneous urticaria (symptoms lasting for longer than 6 weeks). It was more frequently reported in females than males (0.8% vs.

0.3%; $p < 0.05$). Among respondents reporting urticaria symptoms, 40.7% did not remember when the first episode of the disease occurred. Among other individuals, the median age at the first episode of urticaria symptoms was 15 years, and the mean age was 19.5 years (20.7 in women, and 17.8 in men). The difference in the mean age between genders was statistically insignificant ($p = 0.082$). Details are presented in Figure 1.

Among respondents reporting urticaria symptoms, 8.6% were unaware of possible factor(s) inducing disease. In the remaining group, one (66.4%), two (16.9%), three (10.7%) or four and more (6.0%) possible factors were reported. Contact with plants (53%), insect bites/stings (25%), skin contact with other substances or materials (15.3%) and also eating certain foods (12.6%) were the most frequently reported possible eliciting factors.

At least one episode of angioedema was reported by 159 individuals – 3.2% of all respondents (95% CI: 2.8–3.7%) – 2.5% males and 4.0% females ($p < 0.005$). In this group of individuals, 65% reported isolated angioedema (Figure 2). Angioedema accompanied by urticaria symptoms was reported by 35% of respondents from that group (in 29.8%, urticaria occasionally accompanied angioedema, and always in 5.2% of cases).

Among the respondents who reported at least one episode of urticaria symptoms or angioedema, 5.2% reported the last episode within the previous week (0.7% of all study subjects), 7.9% (1%) within the last month, and 17.6% (2.2%) within the last year. There was no statistically significant difference in relation to gender ($p = 0.927$).

Respondents who reported urticaria symptoms or angioedema evaluated the negative impact of the disease

Table 2. Incidence of urticaria symptoms (ever in life) depending on sex, age, and place of living

Parameter	N	%	95% CI
Total	4896	11.2	10.3–12.1
Sex:			
Women	2518	13.0	11.7–14.3
Men	2378	9.3	8.1–10.5
Age [years]:			
15–24	761	12.0	9.7–14.3
25–34	1002	11.7	9.7–13.7
35–44	881	10.0	8.0–11.9
45–54	821	11.8	9.6–14.0
55–64	940	10.7	8.7–12.6
65–74	493	11.2	8.4–14.0
Place of living:			
Rural	1901	11.1	9.7–12.6
Urban	2995	11.2	10.1–12.4



Figure 1. Cumulative graph – age at the first episode of urticaria symptoms, presented by sex ($N = 325$)

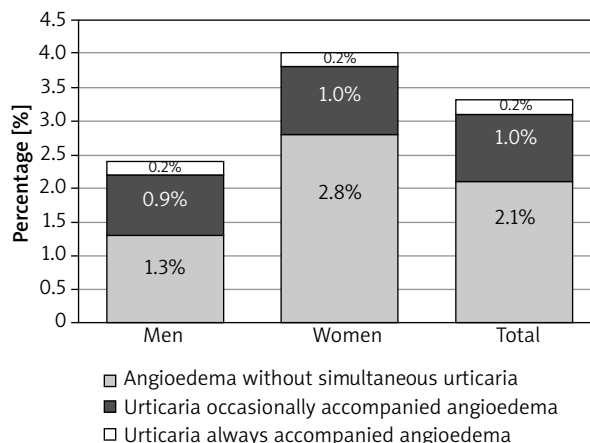


Figure 2. Incidence of angioedema (including the co-occurrence of symptoms of urticaria) presented by sex ($N = 4897$)

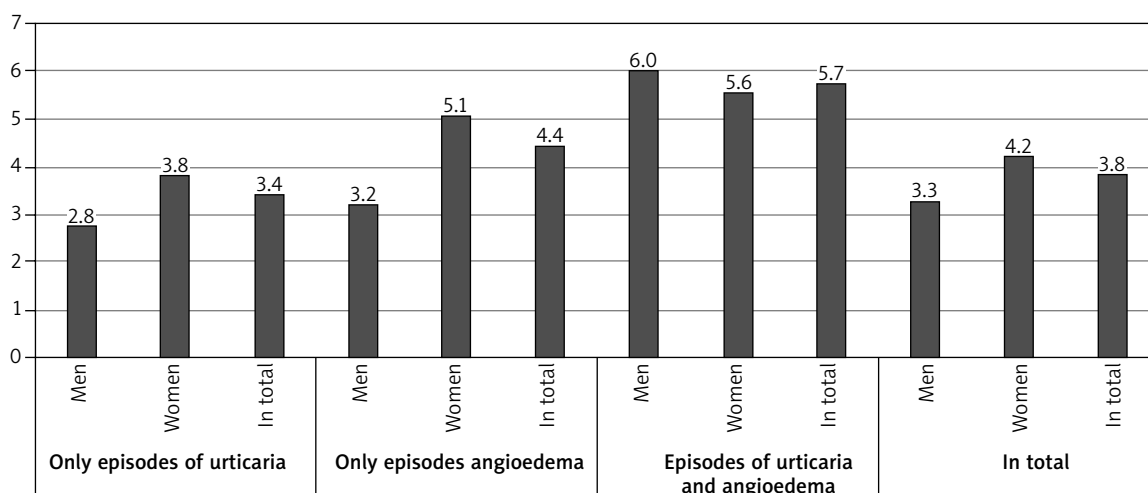


Figure 3. Assessment of the negative impact of urticaria symptoms or angioedema (in the presence of symptoms) on the respondents' lives presented by sex. 0 indicates no effect, 10 the maximum negative impact ($N = 623$)

on their quality of life as a mean value of 3.8 points on a scale of 0–10. There was a statistically significant difference related to gender ($p < 0.001$). The negative impact of chronic urticaria was assessed as 6.5 points, and in acute urticaria as 3.6 points ($p < 0.001$). Angioedema and urticaria symptoms (not necessarily at the same time) were characterized by a negative impact of 5.7 points (Figure 3).

Discussion

The EUP was conducted employing a methodology similar to that of other major global epidemiological questionnaire-based research studies. In 2004, a Spanish study was based on telephone interviews and included 5,003 adults. The methodology and diagnosis criteria were similar to our study [14]. In Greece, a study

was conducted in a group of 12,396 participants using a questionnaire on the internet [16]. In Germany, an epidemiological study on urticaria by Zuberbier *et al.* included inhabitants of Berlin. Four thousand and ninety-three respondents answered the questionnaire-based survey. Individuals suspected of urticaria ($n = 767$) were additionally interviewed by phone. Respondents who reported the occurrence of urticarial signs and symptoms within the last 3 years were then invited to an outpatient study for allergy tests (double-blind study). The questionnaire used included questions concerning signs and symptoms of the disease, its duration, influence on the quality of life (sleep, entertainment, free time, etc.), probable causes of the disease, body areas affected, concomitant angioneurotic edema, and frequency of symptoms [4]. Our study, because of the similar methodology, could be compared to any one of these studies. Additionally,

the advantages of our study include a large sample size (nearly 5,000 individuals), being carried out all over the country (through representative random-quota sample), validation of the questionnaire on a group of 106 individuals before the main study, interviews conducted by renowned international research companies, and the use (as an aid for the respondents) of photos showing the most common symptoms of urticaria and angioedema.

There are limited data on prevalence of urticaria in Poland, with most studies conducted on some selected subgroups of a small sample size. One multi-center, large research study (Epidemiology of Allergic Diseases in Poland – ECAP study) included 4,783 outpatients. The final diagnosis of urticaria was based on the patient's history. In 6–7 and 13–14 year-old children, urticaria was diagnosed in 5.0%, and in adults (20–44 years) in 8.0%, but the ECAP study does not reflect the population structure of Poland [6]. According to our study, 11.2% of respondents aged 15–74 years (95% CI: 10.3–12.1%) reported signs and symptoms of urticaria (3.9% one episode, 7.3% multiple episodes). In our study, there is more than a 3% higher prevalence of urticaria in comparison to the ECAP study. Similarly, Nitter-Marszalska *et al.*, in a group of 2,050 inhabitants of Wrocław, recorded lower incidence of urticaria in their findings (systemic reactions 8.9% with an urticarial flare in 4.7%) [17]. Another study on occupational dermatoses performed in Poland in the period 1998–2000 (145 participants, residents of 37 randomly selected arable farms) reported prevalence of urticaria of 2.8% (95% CI: 0.1–5.4%) [18].

There are some studies on the evaluation of incidence of urticaria in Europe. Gaig *et al.*, in a group of 5,003 respondents, found that the incidence of chronic urticaria in Spain was 0.6% (95% CI: 0.4–0.8%). Females were more often affected (OR = 3.82; 95% CI: 1.56–9.37). Acute urticaria also appeared to be statistically related to gender, respectively 24.7% vs. 16.7% (OR = 1.64; 95% CI: 1.4–1.9). In the global study population, the percentage of individuals with urticaria lasting for more than 6 weeks was 2.9%, and the accumulated incidence of acute urticaria was 18.72% (95% CI: 15.19–22.3%) [14]. Our study showed similar prevalence of chronic urticaria (0.6%, 95% CI: 0.4–0.8%) as in Spain. However, acute urticaria in Poland was reported by considerably fewer respondents (10.6%, 95% CI: 9.8–11.5%). In females, the incidence of acute urticaria was 12.2%, and in males 9%.

According to Zuberbier *et al.* the incidence of urticaria per lifetime was in 8.8% (95% CI: 7.9–9.7). Chronic urticaria was found in 1.8% (95% CI: 1.4–2.3%). An active form of the disease (within the last 12 months) was diagnosed in 0.8% (95% CI: 0.6–1.1%), with females constituting over 70% [4]. Our study showed 2% more of respondents declaring symptoms of urticaria than the result obtained by Zuberbier.

A Turkish study from 2011–2012, performed in a group of 11,040 patients of a dermatology outpatient clinic, re-

ported 8.3% of patients with urticaria, with 54.2% of the female gender. The highest incidence was recorded in the age group between 20 and 50 years [7]. Our findings are similar.

Doña *et al.* in a group of 1,001 Spanish patients with drug allergies observed urticarial in 82.63% of individuals [19]. The incidence of urticaria over 10% of the population, with 62.8% females, was observed in another Spanish epidemiological study (2005). Mean age of patients with urticaria was 35 years, and the maximal incidence was for the age of 49 years. The incidence of urticaria in children was 13.4%, with food as well as drugs reported to be possible triggering factors (19.7% and 9.5%, respectively). Physical urticaria constituted 5.3% of acute urticaria, with dermographism accounting for 3.2% of patients, cold urticaria 1.1%, heat urticaria 0.7%, solar urticaria 0.4%, and vibratory urticaria 1.1% [12].

Angioedema in the Danish epidemiological questionnaire-based survey (3,471 participants; 18–69 years-old) was reported in 7.4%, while urticaria was reported in over 35% [20]. Similar results (6%) were obtained by Kalogeromitros *et al.*, with females having more frequent episodes of both angioedema and urticaria [16]. In the present study, gender also strongly influenced prevalence of angioedema (2.5% males and 4.0% females), but in all groups we recorded a lower level than both Danish and Greek studies. There are various methods of epidemiological research on urticaria due to the large number of subtypes of urticaria. A comparison of different epidemiological studies on urticaria was presented by Śpiwak and Plichta [21].

The main limitation of our study was the research method. The study was carried out with a questionnaire-based method, so urticaria and angioedema were diagnosed based on answers of the respondents. The cards with examples of urticaria and angioedema were presented to respondents to help them distinguish the symptoms of the disease. However, Śpiwak *et al.* found that showing such pictures may evoke emotional responses [22] that may affect the respondents' answers. The answers given by the respondents were not verified in outpatient conditions. On the other hand, it was the only research method that allowed analysis of a representative sample of 5,000 individuals while maintaining acceptable costs. All studies quoted above are considerably different from each other as regards methodology, although they are all based on similar presumptions. They included populations of different habitats, ethnic structure and age. It needs to be stressed that all results and conclusions are based to a significant degree on answers of the respondents. Even if medical consultations have been included in methodology of the trial (as in ECAP's or Zuberbier's study), it was only related to active types of the disease. Therefore, one should not expect similarities to be obtained in terms of results from different surveys. However, all surveys significantly contribute

to the complex picture of epidemiology of urticaria in Europe, and we would like to add the contemporary data on the Polish part of the global ‘map’ of the problem within the European Union.

Conclusions

The findings of the reported study clearly demonstrate that urticaria and angioedema are a serious health problem in Poland, although its prevalence is below the mean rate for the European population. As we expected, acute urticaria was more common. We confirmed that women are more likely to suffer from acute and chronic urticaria and angioedema than men. We also found out that people affected by urticaria most frequently indicate contact with plants, insect bites/stings, skin contact with other substances or materials and eating certain foods as the provoking factors. Furthermore, urticaria has a significant impact on quality of life.

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Conflict of interest

The authors declare no conflict of interest.

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Supplementary material

Appendix 1. Content of the survey questions (English translation)*

1. Have you ever had any symptoms of urticaria?
2. What symptoms of urticaria have you ever observed?
3. Have those symptoms of urticaria occurred once or repeatedly in your life?
4. How often, on average, do you experience the symptoms of urticaria?
5. Has urticaria ever lasted for longer than 6 weeks?
6. What was the duration of the longest period of urticaria symptoms?
7. At what age did you have the first episode of urticaria?
8. What factor causes your urticaria? If you don't know, please tell me what you suspect.
9. Have you ever experienced angioedema?
10. Was it in the course of urticaria?
11. Have you ever had problems with breathing in the course of urticaria or angioedema?
12. Have you consulted a doctor on the symptoms of urticaria or angioedema?
13. What doctors have you consulted on the symptoms of urticaria or angioedema?
14. Did the doctor give you any medications for symptoms of urticaria or angioedema?
15. What medications for symptoms of urticaria or angioedema did you receive from the doctor?
16. Have you ever been to a hospital/hospital emergency room due to urticaria or angioedema?
17. When was the last time that you had urticaria or angioedema?
18. Are you currently on any medications due to urticaria or angioedema?
19. Please try to assess with a score of 0–10 the negative influence of urticaria or angioedema on your life when symptoms appear.

*The full version of the questionnaire includes descriptions, definitions and hints for the respondents.

Appendix 2. Content of the survey questions in Polish (original wording)*

1. Czy kiedykolwiek wystąpiły u Pana/Pani objawy pokrzywki?
2. Jakie objawy pokrzywki kiedykolwiek zaobserwował/zaobserwowała Pan/Pani u siebie?
3. Czy w ciągu Pana/Pani życia objawy pokrzywki wystąpiły u Pana/Pani jednokrotnie czy wielokrotnie?
4. Przeciętnie jak często u Pana/Pani występują objawy pokrzywki?
5. Czy kiedykolwiek pokrzywka utrzymywała się u Pana/Pani dłużej niż 6 tygodni?
6. Ile trwał u Pana/Pani najdłuższy okres z objawami pokrzywki?
7. W jakim wieku miał/miała Pan/Pani pierwszy epizod pokrzywki?
8. Jaki czynnik powoduje u Pana/Pani wystąpienie pokrzywki? Jeśli Pan/Pani nie wie, to proszę podać swoje przypuszczenia.
9. Czy kiedykolwiek doświadczył/doświadczyła Pan/Pani obrzęku naczynioruchowego?
10. Czy ten obrzęk towarzyszył pokrzywce?
11. Czy kiedykolwiek pokrzywce lub obrzękowi naczynioruchowemu towarzyszyły problemy z oddychaniem?
12. Czy objawy pokrzywki lub obrzęku naczynioruchowego konsultował/konsultowała Pan/Pani z lekarzem?
13. Z jakimi lekarzami konsultował/konsultowała Pan/Pani objawy pokrzywki lub obrzęku naczynioruchowego?
14. Czy w związku z objawami pokrzywki lub obrzęku naczynioruchowego lekarz zalecił Panu/Pani jakiegokolwiek leki?
15. Jakie leki zalecił Panu/Pani lekarz w związku z objawami pokrzywki lub obrzęku naczynioruchowego?
16. Czy kiedykolwiek z powodu pokrzywki lub obrzęku naczynioruchowego: był/była Pan/Pani hospitalizowany/hospitalizowana; udzielano Panu/Pani pomocy na pogotowiu (szpitalnym oddziale ratunkowym)?
17. Kiedy ostatni raz miał/miała Pan/Pani pokrzywkę lub obrzęk naczynioruchowy?
18. Czy przyjmuje Pan/Pani obecnie jakiegokolwiek leki ze względu na pokrzywkę lub obrzęk naczynioruchowy?
19. Proszę ogólnie ocenić na skali od 0 do 10, jak duży negatywny wpływ na Pana/Pani życie ma pokrzywka lub obrzęk naczynioruchowy w okresie występowania objawów.

* W pełnej wersji kwestionariusza znajdują się opisy i wskazówki dla respondentów.