Osmangazi Journal of Med, 2025;47(2):233-243
DOI: 10.20515/otd.1622981

Research Article
Araştırma Makalesi

Osmangazi Journal of Medicine
e-ISSN: 2587-1579

Etiological and Clinical Evaluation of Elderly Patients with Pruritus: A Retrospective Cross-sectional Analysis of 700 Patients

Prurituslu Yaşlı Hastaların Etiyolojik ve Klinik Olarak Değerlendirmesi: 700 Hastanın Retrospektif Kesitsel Bir Analizi

Özge Zorlu, Umut Günal, Hülya Albayrak, Sema Aytekin

Tekirdağ Namık Kemal University Faculty of Medicine, Department of Dermatology and Venereology, Tekirdağ, Türkiye

ORCID ID of the authors
ÖZ. 0000-0001-5555-130X
UG. 0009-0005-8872-5165
HA. 0000-0002-2022-578X
SA. 0000-0003-1376-1573

Correspondence / Sorumlu yazar:
Özge ZORLU

Tekirdağ Namık Kemal University Faculty of Medicine, Department of Dermatology and Venereology, Tekirdağ, Türkiye

e-mail: zorluzg@gmail.com

Abstract: Pruritus is one of the most common symptoms in the elderly. It can be associated with dermatological, systemic, neurological, or psychogenic disorders. Identifing the underlying origin and appropriate management of patients are important due to its negative impact on quality of life. We aimed to investigate the demographic and clinical features, etiologies, laboratory work-up, and management of elderly patients with pruritus. A retrospective cross-sectional study was conducted on patients with pruritus aged ≥ 65 years who attended our outpatient clinic between January 2014 and June 2024. Etiological origins were categorized as dermatological, systemic, neurologic, psychogenic, drug-associated, or mixed. A total of 700 patients were included. Pruritus began between the ages of 65-75 years in 69%. Of the patients, 140 (20%) had acute and 560 (80%) had chronic pruritus. Pruritus was localized in 299 (42.7%) and generalized in 401 (57.3%) patients. The trunk, upper and lower extremities were the most common sites of pruritus. The most common causes of pruritus were dermatological (83.6%), followed by systemic (5.6%) and psychogenic (5.1%) origins. The most common dermatological cause of acute pruritus was scabies (20.5%), whereas chronic pruritus was xerosis (32.9%). Chronic renal failure was the leading systemic cause in both acute and chronic pruritus (30% and 42.5%, respectively). In conclusion, the demographics, clinical, and etiological factors of pruritus in the elderly can differ according to the geographic region, sample size, age groups, socioeconomics, lifestyle, and environmental factors. Each patient must be examined and treated individually.
Keywords: Pruritus, Geriatric, Elderly, Prurigo

Özet: Pruritus yaşlılarda en sık görülen semptomlardan biridir. Dermatolojik, sistemik, nörolojik veya psikojenik bozukluklarla ilişkili olabilir. Yaşam kalitesi üzerindeki olumsuz etkisi nedeniyle, altta yatan nedenin belirlenmesi ve hastaların uygun şekilde tedavi edilmesi önemlidir. Bu çalışmada, pruritusu olan yaşlı hastaların demografik ve klinik özelliklerini, etyolojilerini, laboratuvar çalışmalarını ve tedavilerini araştırmayı amaçladık. Ocak 2014 ile Haziran 2024 arasında polikliniğimize başvuran ≥ 65 yaş prurituslu hastalar üzerinde retrospektif kesitsel bir çalışma yürütüldü. Etiyolojik faktörler; dermatolojik, sistemik, nörolojik, psikojenik, ilaç ilişkili veya mikst olarak kategorize edildi. Toplam 700 hasta çalışmaya dahil edildi. Pruritus hastaların %69'unda 65-75 yaşları arasında başlamıştı. Hastaların 140'ında (%20) akut, 560'ında (%80) kronik pruritus vardı. Pruritus 299 (%42,7) hastada lokalize iken 401 (%57,3) hastada jeneralizeydi. Gövde, üst ve alt ekstremiteler pruritusun en sık görülen yerleriydi. Pruritusun en sık görülen nedenleri dermatolojik (%83,6) iken, bunu sistemik (%5,6) ve psikojenik (%5,1) nedenler izliyordu. Akut pruritusun en sık görülen dermatolojik nedeni skabiyez (%20,5) iken, kronik pruritusta kserozis (%32,9) idi. Kronik böbrek yetmezliği hem akut hem de kronik pruritusta en sık sistemik nedendi (%30 ve %42,5). Sonuç olarak, yaşlılarda pruritusun demografik, klinik ve etiyolojik faktörleri coğrafi bölgeye, örneklem büyüklüğüne, yaş gruplarına, sosyoekonomiye, yaşam tarzına ve çevresel faktörlere göre farklılık gösterebilir. Her hasta, bireysel olarak değerlendirilmeli ve tedavi edilmelidir.
Anahtar Kelimeler: Pruritus, Geriatrik, Yaşlılık, Prurigo

Ethics Committee Approval: The study was approved by Tekirdag Namık Kemal University Clinical Research Ethics Committee (2024-220.06.08) (Decision No: 2024/7, Date: 25.06.2024)

Informed Consent: This study did not require informed consent.

Authorship Contributions:

Copyright Transfer Form: Copyright Transfer Formwas signed by all authors.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

Received : 18.01..2024

Accepted : 03.02.2025

Published : 06.02..2025

How to cite/ Atıf için: Zorlu O, Günal U, Albayrak H, Aytekin S, Etiological and Clinical Evaluation of Elderly Patients with Pruritus: A Retrospective Cross-sectional Analysis of 700 Patients; Osmangazi Journal of Medicine, 2025;47(2):233-243

1. Introduction

The proportion of older people is gradually increasing across the world. It is projected that the number of elderly people (aged ≥ 65 years) will more than double from 761 million in 2021 to 1.6 billion in 2050 (1). This situation has led to an increase in aging-related skin conditions and diseases.

Elderly patients can be presented with challenging clinical signs, and difficulties in the diagnosis and treatment of dermatological diseases may occur because of the co-occurrence of multiple health problems, polypharmacy, and difficulties in taking medical history (2).

One of the most common symptoms in the elderly is pruritus, which can be localized or generalized. Anatomical and physiological age-related changes such as dryer and less regenerative skin, skin barrier dysfunction, increased vulnerability to exogenous trigger factors, immunosenescence, or decreased threshold for itch perception can lead to pruritus in elderly people. On the other hand, it can be associated with dermatological disorders, systemic diseases such as chronic renal failure (CRF), hepatobiliary diseases, iron deficiency anemia (IDA), and cancer, medications, or neuropsychogenic causes (3-5).

The incidence of pruritus is believed to increase with age, and it is more common in the elderly than in adults (6). Depending on the geographical region, season, and sample size of the studies, pruritus prevalence in the elderly changes, reported to be between 11.5% and 64% (3, 7-13). A study conducted in Türkiye with 4099 geriatric patients found that the prevalence of pruritus increased with age from 10.3% (65-74 years) to 19.5% (> 85 years). In addition, the frequency of pruritus was reported to show significant seasonal variation that was more common in autumn but less in spring (7).

Pruritus can lead to social disabling, sleep disturbances, distress, and serious impairment of quality of life in the elderly. In addition, it can be a clue for underlying systemic disease. Therefore, it is crucial to identify the underlying origin and give appropriate treatment.

In this retrospective cross-sectional study, we aimed to investigate the demographic and clinical features, etiologic origins, laboratory work-up, and management of elderly patients with pruritus.

2. Materials and Methods

2.1. Study Design and Data Collection

A retrospective cross-sectional study was conducted on patients with acute or chronic pruritus aged ≥ 65 years who attended our outpatient clinic between January 2014 and June 2024. The itch lasting < 6 weeks is classified as acute and lasting ≥ 6 weeks as chronic pruritus (14). The ICD-10 (International Classification of Diseases, 10th revision) code of L29 was used to search for patients on our digital archive records. Patients with missing clinical data or without identified underlying disease were excluded.

Demographics (age and sex), clinical characteristics (the age of onset and the duration of pruritus, locations, accompanying comorbidities such as hepatobiliary, renal, thyroid, and hematological disorders, diabetes mellitus, IDA, or malignities, drug intake for any disease), treatment methods, follow-up durations, treatment responses, and if present, laboratory workups were recorded. The etiological origin of pruritus was categorized as dermatological, systemic, neurologic, psychogenic, drug-associated, or mixed (5, 14). In addition, polypharmacy was defined as using ≥ 5 drugs, and extreme polypharmacy as using ≥ 10 drugs (15, 16).

2.2. Ethics Approval

We obtained ethical approval from the local ethics committee (Decision No: 2024.220.06.08, Date: June 25, 2024).

2.3. Statistical Analysis

SPSS v.25 software (IBM Corp. Armonk, NY: USA) was used for statistical analysis. Categorical variables were presented as n (%). Continuous variables were reported as the median (interquartile range [IQR]) depending on the normality. The normal distribution of continuous variables was assessed with the Kolmogorov–Smirnov test. According to the normality test results, the Mann–Whitney U test was used for comparisons between the two groups. The Pearson χ^2 test or Fisher–Freeman–Halton test was used to compare categorical variables between patients with chronic or acute pruritus. A *P*-value < 0.05 was considered statistically significant.

3. Results

3.1. Demographics and Clinical Features

A total of 1039 patients were attended to our outpatient clinic due to acute or chronic pruritus in 10 years. Out of 1039 patients, 700 were included in the study. The demographics and clinical characteristics of the patients are presented in Table 1. In most patients (69%), pruritus began between the ages of 65-75 years. Of the patients, 140 (20%) had acute pruritus, and 560 (80%) had chronic pruritus. Pruritus was localized in 299 (42.7%) and generalized in 401 (57.3%) patients. The trunk, upper and lower extremities were the most common sites of pruritus. Among accompanying comorbidities, diabetes mellitus and CRF were significantly more common in patients with chronic pruritus (P = 0.001 and P = 0.017, respectively). Similarly, polypharmacy was more common in patients with chronic pruritus (P = 0.029).

Table 1. Demographics, clinical characteristics, and comorbidities of the patients

Characteristics	**Total (n = 700)**	**Acute pruritus (n = 140)**	**Chronic pruritus (n = 560)**	***P***
	n, %	**n, %**	**n, %**	
Sex				0.045
Female	352 (50.3%)	81 (57.9%)	271 (48.4%)	
Male	348 (49.7%)	59 (42.1%)	289 (51.6%)	
Age of onset of pruritus				0.012
65-70	269 (38.4%)	62 of 269 (23%)	207 of 269 (77%)	
71-75	214 (30.6%)	49 of 214 (22.9%)	165 of 214 (77.1%)	
76-80	132 (18.9%)	18 of 132 (13.6%)	114 of 132 (86.4%)	
81-85	69 (9.9%)	6 of 69 (8.7%)	63 of 69 (91.3%)	
≥ 86	16 (2.3%)	5 of 16 (31.3%)	11 of 16 (68.8%)	
Involvement				0.032
Localized	299 (42.7%)	71 (50.7%)	228 (40.7%)	
Generalized	401 (57.3%)	69 (49.3%)	332 (59.3%)	
Location of pruritus				
Scalp	49 (7%)	11 (7.9%)	38 (6.8%)	0.657
Face	37 (5.3%)	6 (4.3%)	31 (5.5%)	0.554
Neck	29 (4.1%)	3 (2.1%)	26 (4.6%)	0.184
Anterior trunk	392 (56%)	70 (50%)	322 (57.5%)	0.110
Back	415 (59.3%)	67 (47.9%)	348 (62.1%)	0.002
Hands	296 (42.3%)	57 (40.7%)	239 (42.7%)	0.674
Arms	342 (48.9%)	64 (45.7%)	278 (48.6%)	0.406
Upper legs	343 (49%)	48 (34.3%)	295 (52.7%)	< 0.001
Lower legs	344 (49.1%)	53 (37.9%)	291 (52%)	0.003
Genital	84 (12%)	24 (17.1%)	60 (10.7%)	0.036
Anal	34 (4.9%)	8 (5.7%)	26 (4.6%)	0.598
Feet	78 (11.1%)	15 (10.7%)	63 (11.3%)	0.857
Comorbidities				
Diabetes mellitus	177 (25.3%)	22 (12.4%)	155 (27.7%)	0.004
Hepatobiliary disease	23 (3.3%)	8 (5.7%)	15 (2.7%)	0.072
CRF	66 (9.4%)	7 (5%)	59 (10.5%)	0.045
Hyperthyroidism	2 (0.3%)	1 (0.7%)	1 (0.2%)	0.361
Hypothyroidism	15 (2.1%)	2 (1.4%)	13 (2.3%)	0.747
IDA	53 (7.6%)	8 (10.7%)	45 (11.8%)	0.783
Hematological malignancy	12 (1.7%)	3 (2.1%)	9 (1.6%)	0.423
Lymphoma	3	1	2	
CML	3	0	3	
CMD	2	1	1	
MDS	2	0	2	
Multiple myeloma	2	1	1	
Solid organ malignancy	61 (8.7%)	14 (10%)	47 (8.4%)	0.546
Breast	14	6	8	
Colorectal	11	3	8	
Prostate	8	1	7	
Lung	8	0	8	
Head and neck SCC	4	0	4	
Urinary bladder	4	0	4	
Gastric	3	0	3	
Melanoma*	3	2	1	
Liver	2	1	1	
Endometrium	2	1	1	
Renal	1	0	1	
Vulva SCC	1	0	1	
Polypharmacy	235 (33.6%)	37 (26.4%)	198 (35.4%)	0.045
Extreme polypharmacy	46 (6.6%)	10 (7.1%)	36 (6.4%)	0.760

*CRF, chronic renal failure; IDA, iron deficiency anemia; CML, chronic myelogenous leukemia; CMD, chronic myeloprolipherative disorder; MDS, myelodysplastic syndrome; SCC, squamous cell carcinoma. *skin or uveal malign melanoma*

3.2. Etiology of Pruritus

The etiological categories of pruritus are summarized in Table 2. The most common causes of pruritus were dermatological origin in both acute (88.6%) and chronic (82.3%) pruritus, followed by systemic causes (4.3%) in acute pruritus and psychogenic causes (6.4%) in chronic pruritus. The etiological categories of pruritus did not significantly differ between patients with chronic or acute pruritus ($P = 0.054$).

Table 2. Etiological categories of pruritus

Etiology	Total (n = 700)	Acute pruritus (n = 140)	Chronic pruritus (n = 560)	*P*
	n, %	n, %	n, %	
Dermatological	585 (83.6%)	124 (88.6%)	461 (82.3%)	0.054
Systemic	39 (5.6%)	6 (4.3%)	33 (5.9%)	
Neurological	10 (1.4%)	2 (1.4%)	8 (1.4%)	
Psychogenic	36 (5.1%)	0	36 (6.4%)	
Drugs	19 (2.7%)	5 (3.6%)	14 (2.5%)	
Mixed	11 (1.6%)	3 (2.1%)	8 (1.4%)	

Table 3 shows the details of the origins of pruritus. Regarding dermatological origins of acute pruritus, scabies was the most common cause in 22.1%, followed by dermatitis (19.3%), xerosis (19.3%), and fungal infections (12.1%). On the other hand, among dermatological causes of chronic pruritus, xerosis was the most common reason in 32.1%, followed by dermatitis in 21.8%, then fungal infections (7.9%) and scabies (7.7%).

Of the systemic causes, CRF was the most common in acute and chronic pruritus (33.3% and 41.5%, respectively). Iron deficiency anemia (24.4%) and malignancy (19.5%) were the other common reasons in patients with chronic pruritus regarding systemic origins. All patients with malignancy-associated pruritus were previously known to have cancer. 54.5% of patients with IDA and 15% with CRF were first diagnosed at the time of presentation.

Regarding neurological origins, six patients had postherpetic neuralgia, three had notalgia paraesthetica, and one had brachioradial pruritus.

The accountable drugs for drug-induced pruritus were anti-cancer agents in 8 (panitumumab, n = 2; erlotinib, n = 2; trastuzumab, n = 1; paclitaxel, n = 1; azacitidine, n = 1), antihypertensives in 6 (angiotensin receptor blocker/hydrochlorothiazide combination, n = 3; spironolactone/hydrochlorothiazide combination, n = 1; ramipril/hydrochlorothiazide combination, n = 1; furosemide, n = 1), aspirin in 1, metformin/vidagliptin combination in 1, amitriptyline in 1, ciprofloxacine in 1, and contrast media in 1.

Table 3. Clinical origins of pruritus

Diagnosis	Total (n = 700)	Acute pruritus* (n = 140)	Chronic pruritus* (n = 560)
	n, %	n, %	n, %
Xerosis	207 (29.6%)	27 (19.3%)	180 (32.1%)
Dermatitis	149 (21.3%)	27 (19.3%)	122 (21.8%)
Infestations			
Scabies	74 (10.6%)	31 (22.1%)	43 (7.7%)
Pediculosis	1 (0.1%)	1 (0.7%)	0
Fungal infection	61 (8.7%)	17 (12.1%)	44 (7.9%)
Urticaria	31 (4.4%)	7 (5%)	24 (4.3%)
Insect bite	14 (2%)	11 (7.9%)	3 (0.5%)
Psoriasis	12 (1.7%)	1 (0.7%)	11 (2%)
Mycosis fungoides	8 (1.1%)	1 (0.7%)	7 (1.3%)
Bullous pemphigoid	6 (0.9%)	0	6 (1.1%)
Amiloidosis cutis	6 (0.9%)	0	6 (1.1%)

Seborrheic keratosis	5 (0.7%)	0	5 (0.9%)
CRF-associated pruritus	20 (2.9%)	3 (2.1%)	17 (3%)
Malignancy-associated pruritus	10 (1.4%)	2 (1.4%)	8 (1.4%)
Colorectal cancer-associated	5	1	4
Lymphoma-associated	3	0	3
Multiple myeloma-associated	1	1	0
Gastric cancer-associated	1	0	1
Hepatobiliary pruritus	6 (0.8%)	2 (1.4%)	4 (0.7%)
IDA	11 (1.6%)	1 (0.7%)	10 (1.8%)
Hypothyroidism	2 (0.3%)	0	2 (0.4%)
Hyperthyroidism	1 (0.1%)	1 (0.7%)	0
Neurogenic pruritus	10 (1.4%)	2 (1.4%)	8 (1.4%)
Psychogenic dermatoses		0	36 (6.4%)
Prurigo nodularis	14 (2%)	0	14
LSC	16 (2.3%)	0	16
Delusional parasitosis	2 (0.3%)	0	2
Psychogenic excoriation	4 (0.6%)	0	4
Drug-induced reactions	19 (2.7%)	5 (3.6%)	14 (2.5%)
Others	26 (3.7%)	4 (2.9%)	22 (3.9%)

*LSC, lichen simplex chronicus; CRF, chronic renal failure; IDA, iron deficiency anemia. *Pearson χ^2 test. P < 0.001.*

3.3. Laboratory Evaluation and Treatment

At least one laboratory test was performed to identify the etiology of chronic pruritus in 466 (66.6%) patients. The most frequently performed laboratory tests were complete blood count, liver function tests, and creatinine levels in acute and chronic pruritus. Laboratory workup of the patients is shown in Table 4. Blood eosinophile counts were significantly higher in patients with chronic pruritus than acute pruritus (0.21 [0.14–0.33] and 0.18 [0.13–0.30] x10^3/μL, respectively. *P* = 0.041). However, eosinophil percentages were not significantly different between acute and chronic pruritus (3 [2–4.4] and 3 [2.1–4.6], respectively. *P* = 0.542).

Table 4. Laboratory tests performed in patients with pruritus

Laboratory parameters	**Total (n = 700)**	**Acute pruritus (n = 140)**	**Chronic pruritus (n = 560)**	***P***
	n, %	**n, %**	**n, %**	
CBC	455 (65%)	74 (52.9%)	381 (68%)	0.001
FBG	196 (28%)	21 (15%)	175 (31.3%)	< 0.001
Ferritin	227 (32.4%)	24 (17.1%)	203 (36.3%)	< 0.001
Iron/TIBC	180 (25.7%)	20 (14.3%)	160 (28.6%)	0.001
Bilirubin	197 (28.1%)	31 (22.1%)	166 (29.6%)	0.078
ALT & AST	438 (62.6%)	71 (50.7%)	367 (65.5%)	0.001
BUN	210 (30%)	32 (22.9%)	178 (31.8%)	0.039
Creatinine	436 (62.3%)	66 (47.1%)	370 (66.1%)	< 0.001
GFR	198 (28.3%)	28 (20%)	170 (30.4%)	0.015
Total IgE	92 (13.1%)	9 (6.4%)	83 (14.8%)	0.009
TFT	298 (42.6%)	39 (27.9%)	259 (46.3%)	< 0.001
Thyroid autoantibodies	47 (6.7%)	1 (0.7%)	46 (8.2%)	0.002
ESR	211 (30.1%)	26 (18.6%)	185 (33%)	0.001
CRP	272 (38.9%)	43 (30.7%)	229 (40.9%)	0.027
HBV and HCV serology	86 (12.3%)	4 (2.9%)	82 (14.7%)	< 0.001
HIV	69 (9.9%)	2 (1.4%)	67 (12%)	< 0.001
Urinalysis	144 (20.6%)	14 (10.1%)	130 (23.3%)	0.001

CBC, complete blood count; FBG, fasting blood glucose; TIBC, total iron binding capacity; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BUN, blood urea nitrogen; GFR, glomerular filtration rate; TFT, thyroid function tests; ESR, erythrocyte sedimentation rate; CRP, C reactive protein; HBV, hepatitis B virus; HCV, hepatitis C virüs; HIV, human immunodeficiency virüs.

Table 5 shows the treatment methods used in the patients and treatment responses. Complete response was observed in 363 (51.9%) patients treated with emollients, topical steroids, systemic antihistaminics, antifungal agents, systemic steroids, phototherapy, or antidepressants. However, 176 patients needed other treatments, such as gabapentine, cyclosporine, methotrexate, or

omalizumab, or the treatment of underlying disease for complete response. The median (IQR) follow-up duration was 3 (1–12) months. Relapse was observed in 10 (7.3%) and 132 (23.7%) patients with acute and chronic pruritus, respectively. The median relapse time was 4.5 (2–9.3) months. Regarding acute pruritus, relapses were observed in patients with dermatitis (n = 3), scabies (n = 3), fungal infections (n = 2), urticaria (n = 1), neurological disease (n = 1), and drug-induced reaction (n = 1). In chronic pruritus, relapses were observed in patients with dermatitis (n = 38), xerosis (n = 35), urticaria (n = 8), fungal infections (n = 7), psychiatric disorders (n = 7), scabies (n = 6), drug-induced reactions (n = 5), bullous pemphigoid (n = 5), and the other reasons.

Table 5. Treatment methods used in pruritus, follow-up durations, and treatment responses

Treatments	**Total (n = 700)**	**Acute pruritus (n = 140)**	**Chronic pruritus (n = 560)**	***P***
	n, %	**n, %**	**n, %**	
Emolients	481 (68.7%)	73 (52.5%)	408 (73.1%)	< 0.001
Topical steroids	399 (57.2%)	71 (51.1%)	328 (58.7%)	0.041
Antihistaminics	480 (68.8%)	76 (54.7%)	404 (72.3%)	< 0.001
Systemic steroid	47 (6.7%)	3 (2.2%)	44 (7.9%)	0.016
Antidepressants	13 (1.9%)	0	13 (2.3%)	0.073
Phototherapy	16 (2.3%)	0	16 (2.9%)	0.048
Others	327 (46.7%)	72 (51.8%)	255 (45.5%)	0.172
Follow-up duration (months)	3 (1–12)	2 (1–3)	3 (2–13)	< 0.001
Treatment response				0.066
No response	11 (1.6%)	2 (1.4%)	9 (1.6%)	
Complete response	363 (51.9%)	83 (59.7%)	280 (50.1%)	
Partial response	152 (21.7%)	19 (13.7%)	133 (23.8%)	
Not evaluated	176 (25.3%)	35 (25.2%)	137 (24.5%)	

4. Discussion

Our results provide a detailed characterization of patients with acute or chronic pruritus, one of the most common complaints in the elderly, referred to a tertiary referral center. Most of our patients had chronic pruritus (80%). Females were predominant among patients with acute pruritus, whereas males were more common in chronic pruritus. We found that most patients with pruritus were at the age of 65-75 years, and the incidence gradually declined as the age increased. Dermatological causes were the most common etiologies, followed by systemic and psychiatric disorders and drug-induced reactions.

4.1. Demographics and Clinical Features

In our study, the female:male (F:M) ratio was almost 1:1. However, among patients with acute pruritus, females were more common (F:M = 1.4:1), whereas in chronic pruritus vice versa (F:M = 0.9:1) (P = 0.045). The results of previous studies regarding sex differences differed. Yalçin et al. reported that pruritus was slightly more frequent among female geriatric patients (F:M = 1.1:1) in their study from Türkiye (7). On the other hand, Liao et al., from Taiwan, reported that males were more frequent among 2408 pruritus patients in geriatric age (F:M = 0.9:1) (8). Similarly, Aboeldahab et al. and Bilgili et al. reported that pruritus was more common in males (F:M = 0.3:1 and F:M = 0.7:1, respectively) (17, 18). However, pruritus was not differentiated as acute or chronic in none of these studies. In a study conducted on patients with chronic pruritus from Türkiye, F:M ratio was 1.1:1, distinctly from our results (19).

Yalçin et al. found that the prevalence of pruritus increased with age from 10.3% (65-74 years) to 19.5% (> 85 years) in their study conducted on 4099 geriatric patients, similar to the study of Darjani et al (7, 20). On the other hand, Bilgili et al. reported that pruritus was more common in the age of 65-74 (5.4%) compared to the age of ≥ 75 (3.4%). However, in that study, the diseases causing pruritus, such as dermatitis, xerosis, fungal infections, scabies, and urticaria, were evaluated separately from pruritus (18). In our study, most of the patients who attended our center because of pruritus were at the age of 65-70, and the number of patients gradually decreased towards the ages of > 85: only 16 patients (2.3%) were > 85 years old. The

difficulties in reaching a hospital, disabilities, socioeconomic issues, reference to the other specialties, or absence of the complaint of pruritus may lead to this situation.

Regarding the involvement areas, the results of previous studies were variable. Aboeldahab Snr et al. reported that 73.8% of their patients presented with generalized pruritus with the most commonly affected sites of upper and lower limbs and back (17). Valdes-Rodriguez et al. reported that the legs, back, scalp, and arms were the most involved areas, respectively, and involvement was symmetrical in 60% (21). Similarly, pruritus was generalized in 57.3% of our patients. The trunk, upper and lower extremities were the most affected sites, whereas the anal region was the least.

Although pruritus due to a systemic disease is often generalized, it can also present with localized symptoms. In some cases, the location of pruritus may be helpful in predicting the possible causative systemic diseases. Among systemic diseases, CRF-associated pruritus mostly affects the back, upper (especially the shunt arm) or lower extremities, chest, and face when localized, although any sites can be involved. However, it is generalized in up to 50% of patients (22-24). On the other hand, hepatobiliary pruritus typically involves the palms and soles; however, different areas, such as the upper trunk, can also be affected, and generalized pruritus can occur (24, 25). Moreover, despite unexplained and persistent generalized pruritus being a sign of hematologic malignancies, Hodgkin lymphoma can cause localized intense itch on the lower extremities and accompanying ichthyosiform skin changes (26, 27). In our patients, 50% of hepatic (3 out of 6) and paraneoplastic (5 out of 10) pruritus, 45% of CRF-associated pruritus (9 out of 20), and 46% of IDA-associated pruritus (5 out of 11) were localized. Among these patients with localized itch, mostly affected areas were the back in hepatobiliary (n = 2) and CRF-associated (n = 5), upper extremities in paraneoplastic (colorectal cancer, n = 2), and legs in IDA-associated pruritus (n = 2). The other malignancies leading to the localized itch were multiple myeloma with back itch, vulvar carcinoma with genital itch, and squamous cell carcinoma with facial itch. Therefore, although localized pruritus without any primary skin lesions suggests the possibility of neuropathic or psychogenic itch, the possible underlying systemic causes should also considered.

4.2. Etiology of Pruritus

Geriatric pruritus can have multiple causes that can occur in association with dermatological, systemic, neurologic, psychiatric disorders, adverse drug reactions, or a combination of these factors (14). Clinicians should focus on if there is any evidence of systemic disease in the absence of primary skin disorders.

Most of our patients (83.6%) had pruritus due to a dermatological cause. Among them, scabies (22.1%), dermatitis (19.3%), and xerosis (19.3%) were the most common reasons for acute pruritus. On the other hand, xerosis (32.1%), dermatitis (21.8%), fungal infections (7.9%), and scabies (7.7%) were the leading reasons for chronic pruritus. Valdes-Rodriguez et al. also reported that xerosis and itch-related dermatoses were the most frequent reasons for chronic pruritus (21). Aboeldahab et al. also found dermatitis and xerosis were the leading dermatological causes of pruritus, yet they did not categorize pruritus as acute or chronic in their study (17). In addition, in most studies regarding skin signs and diseases in geriatric patients, pruritus and pruritus-related dermatoses, such as dermatitis, infestations, infections, and urticaria, were evaluated in separate categories. Therefore, the exact frequencies of dermatologic causes of pruritus are hard to establish in those studies (7, 11, 18, 20, 28, 29).

On the other hand, pruritus occurred due to a systemic disorder in 5.6%. Various systemic disorders such as CRF, chronic liver disease, cholestasis, hypo/hyperthyroidism, iron deficiency anemia, or malignancies can cause pruritus with or without a skin lesion in the elderly. In our study, renal pruritus was the most common systemic cause of pruritus, followed by IDA. Both etiologies mostly caused chronic pruritus. The increase in the prevalence of diabetes and hypertension, and availability of dialysis, and improved life expectancy contribute to CRF becoming a geriatric problem (3). Systemic causes of pruritus vary according to the studies. In a study conducted on 631 geriatric patients with chronic pruritus, IDA was reported as the most common pruritus-associated systemic disease (19). In another one, diabetes mellitus and venous insufficiency were found to be correlated with pruritus (21). Lehmann et al. reported that chronic liver diseases, chronic kidney diseases, diabetes, and cancer were commonly linked to chronic pruritus (30). Therefore, physical examination and laboratory evaluation of patients with pruritus, especially those without primary skin

findings, should focus on the clues of systemic origins.

Chronic pruritus can be a presenting sign of both hematological or visceral malignancies (13, 31). We observed that both hematological (n = 4) and solid organ malignancies (n = 6) caused pruritus. The most common malignancy leading to pruritus among our patients was colorectal cancer (n = 5). However, our findings were limited by cross-sectional and retrospective design and restricted to our selected samples with the ICD code of L29. Therefore, further studies with larger sample sizes are necessary to examine the prevalence of malignancies among patients with pruritus.

Psychogenic pruritus is a poorly defined diagnosis that is described as itch not related to dermatologic or systemic causes. Psychogenic pruritus may accompany various psychiatric conditions. Pruritic disorders can cause psychiatric sequels or be exacerbated by psychiatric conditions. On the other hand, psychiatric disorders can also lead to pruritus. Therefore, determining the exact cause may be challenging sometimes (32, 33). Clinicians should focus on psychiatric causes if the dermatological and systemic causes are excluded. Among our patients, psychogenic pruritus was observed in 5.1% of patients, and all had chronic pruritus.

Neuropathic pruritus is caused by damage to the peripheral or central somatosensory neurons (14, 34). The epidemiology of neuropathic pruritus is still understudied. It is estimated that 8-19% of patients with chronic pruritus have a neuropathic origin (35, 36). One of the common causes of neuropathic itch is postherpetic neuralgia occurring at the site of the affected peripheral nerve. Brachioradial pruritus, notalgia paresthetica, and meralgia paresthetica are the other examples of neuropathic pruritus. In addition, burns, scars, radiculopathies, or neuropathies can cause neuropathic itch (34, 36, 37). In our patients, 1.4% of patients with both acute and chronic pruritus had a neurologic origin, and postherpetic neuralgia was the most frequent.

Polypharmacy is a prevalent issue in the elderly. Many drugs, such as diuretics, antihypertensives, antilipidemics, or chemotherapeutics, can lead to pruritus through drug-induced eruptions, hepatobiliary or renal injury, toxicity, xerosis, neuropathy, drug-drug interactions, deposits of the drug/drug metabolites, or unknown mechanisms (3, 38). Yalçın et al. reported the prevalence of adverse cutaneous drug reactions as 1.4% among 4099 geriatric patients (7). Although drug-induced pruritus, the one without skin rash, is categorized under “systemic origin” according to the International Forum for the Study of Itch classification, the treatment itself can cause pruritus without a systemic or neurologic disease. Therefore, adverse drug effects should be considered as a possible origin when assessing patients with pruritus (4, 14). In our study, we evaluated drug-induced pruritus, observed in 2.7%, separately from systemic origins. Drug-induced pruritus occurred mostly associated with antineoplastic or antihypertensive agents (n = 8 and n = 7, respectively).

4.3. Laboratory Evaluation and Treatment

In the absence of specific skin findings, systemic origins of pruritus should be investigated. Although there are no determined laboratory cut-off levels indicating the causative internal disease, the recommended basic laboratory orders are complete blood count, liver function tests, blood urea nitrogen, creatinine, serum glucose level, thyroid gland function tests, C-reactive protein level, or erythrocyte sedimentation rate (4, 39, 40). In addition to these basic tests, lactate dehydrogenase, ferritin, and stool occult blood are recommended among the first-step laboratory screening in chronic pruritus in the European S2k Guideline on Chronic Pruritus for > 40-year-old patients (40). Depending on the results, more detailed laboratory tests can be ordered, such as serum iron level, HIV, hepatitis B and C serologies, serum protein electrophoresis, or skin biopsy (4, 5, 39, 40). In our study, the most commonly ordered laboratory tests were CBC (65%), transaminases (62.6%), and creatinine (62.3%), followed by TFT (42.6%).

Underlying systemic diseases can be previously known or diagnosed when a patient presents with an itch. Aboeldahab et al. reported that, among systemic causes, 17% of elderly patients with renal diseases were first diagnosed at the patient’s examination, whereas 83% were already known. In addition, 37.2% of hepatic causes were first revealed at the presentation (17). Yorulmaz et al. reported that abnormal laboratory results led to a diagnosis of systemic disease related to pruritus in 6.7% of elderly patients (19). In our study, 54.5% of patients with IDA and 15% with CRF were first diagnosed at the time of presentation. Therefore, pruritus may be a prominent and diagnostic feature of a systemic disease, and detailed physical and laboratory examinations should be done, especially in the absence of any primary dermatological disease.

In the elderly, patient-specific conditions, including general health status, comorbidities, contraindications, drug-drug interactions due to polypharmacy, underlying etiologic factors of pruritus, and adherence to the therapies should be taken into account while the treatment planning for pruritus. Pruritus can be more resistant to the therapies if it occurs due to an underlying systemic or neuropscyhogenic disease. Therefore, every patient must be treated individually. In our study, the most common agents were systemic antihistaminics, emollients, and systemic steroids. However, only 52% of patients showed a complete response to the treatments.

4.4. Study Limitations

It was a single-center study, and only patients registered with an L29 ICD code on our digital archives were analyzed. However, the other patients registered with other ICD codes of pruritic disorders such as urticaria, atopic dermatitis, scabies, bullous pemphigoid, or dermatitis herpetiformis were not included. The reviewed medical records were limited due to the retrospective nature. As another limitation, there was no standard laboratory work-up protocol; instead, each test was ordered according to the preferences of the individual clinicians at our center.

5. Conclusion

The demographic, clinical, and etiological factors of pruritus in the elderly can differ according to the geographic region, sample size, age groups, socioeconomics, lifestyle, and environmental factors. Considering the aging population across the world, improving knowledge of pruritus, one of the most common dermatological complaints in the elderly, is crucial. An approach on a patient-by-patient basis and taking into consideration patients' comorbidities, physical examination findings indicating a systemic disease, quality of life, mental health, and multiple drug use are important. Future studies on larger sample sizes from different regions would be more indicative of geriatric pruritus.

REFERENCES

1. United Nations Department of Economic and Social Affairs. An Ageing World. In: World social report 2023 : leaving no one behind in an ageing World. United Nations, 2023. p. 17-34.
2. Farage MA, Miller KW, Berardesca E, Maibach HI. Clinical implications of aging skin: cutaneous disorders in the elderly. Am J Clin Dermatol. 2009;10(2):73-86.
3. Cao T, Tey HL, Yosipovitch G. Chronic Pruritus in the Geriatric Population. Dermatol Clin. 2018;36(3):199-211.
4. Reich A, Ständer S, Szepietowski JC. Pruritus in the elderly. Clin Dermatol. 2011;29(1):15-23.
5. Steinhoff M, Al-Khawaga S, Buddenkotte J. Itch in elderly patients: Origin, diagnostics, management. J Allergy Clin Immunol. 2023;152(1):42-9.
6. Ständer S, Schäfer I, Phan NQ, Blome C, Herberger K, Heigel H, et al. Prevalence of chronic pruritus in Germany: results of a cross-sectional study in a sample working population of 11,730. Dermatology. 2010;221(3):229-35.
7. Yalçin B, Tamer E, Toy GG, Oztaş P, Hayran M, Alli N. The prevalence of skin diseases in the elderly: analysis of 4099 geriatric patients. Int J Dermatol. 2006;45(6):672-6.
8. Liao YH, Chen KH, Tseng MP, Sun CC. Pattern of skin diseases in a geriatric patient group in Taiwan: a 7-year survey from the outpatient clinic of a university medical center. Dermatology. 2001;203(4):308-13.
9. Weisshaar E, Dalgard F. Epidemiology of itch: adding to the burden of skin morbidity. Acta Derm Venereol. 2009;89(4):339-50.
10. Thaipisuttikul Y. Pruritic skin diseases in the elderly. J Dermatol. 1998;25(3):153-7.
11. Reszke R, Pełka D, Walasek A, Machaj Z, Reich A. Skin disorders in elderly subjects. Int J Dermatol. 2015;54(9):e332-8.
12. Norman RA. Xerosis and pruritus in the elderly: recognition and management. Dermatol Ther. 2003;16(3):254-9.
13. Dyhre-Petersen N, Gazerani P. Presence and characteristics of senile pruritus among Danish elderly living in nursing homes. Future Sci OA. 2019;5(6):FSO399.
14. Ständer S, Weisshaar E, Mettang T, Szepietowski JC, Carstens E, Ikoma A, et al. Clinical classification of itch: a position paper of the International Forum for the

Study of Itch. Acta Derm Venereol. 2007;87(4):291-4.
15. Masnoon N, Shakib S, Kalisch-Ellett L, Caughey GE. What is polypharmacy? A systematic review of definitions. BMC Geriatr. 2017;17(1):230.
16. Novak J, Goldberg A, Dharmarajan K, Amini A, Maggiore RJ, Presley CJ, et al. Polypharmacy in older adults with cancer undergoing radiotherapy: A review. J Geriatr Oncol. 2022;13(6):778-83.
17. Aboeldahab S, Khalil F, Ezz Eldawla R. Clinical and Laboratory Characteristics of Elderly Patients with Pruritus. Clin Cosmet Investig Dermatol. 2021;14:1009-15.
18. Gunes Bilgili S, Karadağ AS, Uce Ozkol H, Calka O, Akdeniz N. The prevalence of skin diseases among the geriatric patients in Eastern Turkey. J Pak Med Assoc. 2012;62(6):535-9.
19. Yorulmaz A, Tabanlıoğlu Onan D, Kulcu Çakmak S, Yalçın B. A retrospective study on the etiologıcal factors of chronic pruritus in the elderly. Turkish Journal of Geriatrics. 2017;20(3):187-93.
20. Darjani A, Mohtasham-Amiri Z, Mohammad Amini K, Golchai J, Sadre-Eshkevari S, Alizade N. Skin Disorders among Elder Patients in a Referral Center in Northern Iran (2011). Dermatol Res Pract. 2013;2013:193205.
21. Valdes-Rodriguez R, Mollanazar NK, González-Muro J, Nattkemper L, Torres-Alvarez B, López-Esqueda FJ, et al. Itch prevalence and characteristics in a Hispanic geriatric population: a comprehensive study using a standardized itch questionnaire. Acta Derm Venereol. 2015;95(4):417-21.
22. Verduzco HA, Shirazian S. CKD-Associated Pruritus: New Insights Into Diagnosis, Pathogenesis, and Management. Kidney Int Rep. 2020;5(9):1387-402.
23. Mettang T, Pauli-Magnus C, Alscher DM. Uraemic pruritus--new perspectives and insights from recent trials. Nephrol Dial Transplant. 2002;17(9):1558-63.
24. Hashimoto T, Yosipovitch G. Itching as a systemic disease. J Allergy Clin Immunol. 2019;144(2):375-80.
25. Beuers U, Wolters F, Oude Elferink RPJ. Mechanisms of pruritus in cholestasis: understanding and treating the itch. Nat Rev Gastroenterol Hepatol. 2023;20(1):26-36.
26. Cavalli F. Rare syndromes in Hodgkin's disease. Ann Oncol. 1998;9 Suppl 5:S109-13
27. Wang H, Yosipovitch G. New insights into the pathophysiology and treatment of chronic itch in patients with end-stage renal disease, chronic liver disease, and lymphoma. Int J Dermatol. 2010;49(1):1-11
28. Kılıc A¸ Gul U, Aslan E, Soylu S. Dermatological findings in the senior population of nursing homes in Turkey. Arch Gerontol and Geriatr. 2008;47:93-8.
29. El-Hamd MA, Abd-Elmaged WM, Mohammed NA. Skin disorders among elderly patients: clinicodemographic characteristics of 808 Egyptian patients. Egyptian Journal of Dermatology and Venerology. 2020;40(1):38-44.
30. Lehmann M, Cazzaniga S, Simon D, Perruchoud DL, Borradori L, Rammlmair A. Patterns among Patients with Chronic Pruritus: A Retrospective Analysis of 170 Patients. Acta Derm Venereol. 2020;100(4):5668.
31. Johannesdottir SA, Farkas DK, Vinding GR, Pedersen L, Lamberg A, Sørensen HT, et al. Cancer incidence among patients with a hospital diagnosis of pruritus: a nationwide Danish cohort study. Br J Dermatol. 2014;171(4):839-46.
32. Buteau A, Reichenberg J. Psychogenic Pruritus and Its Management. Dermatol Clin. 2018;36(3):309-14.
33. Misery L, Alexandre S, Dutray S, Chastaing M, Consoli SG, Audra H, et al. Functional itch disorder or psychogenic pruritus: suggested diagnosis criteria from the French psychodermatology group. Acta Derm Venereol. 2007;87(4):341-4.
34. Kwatra SG, Kambala A, Dong X. Neuropathic pruritus. J Allergy Clin Immunol. 2023;152(1):36-8.
35. Meixiong J, Dong X, Weng HJ. Neuropathic Itch. Cells. 2020;9(10):2263.
36. Stumpf A, Ständer S. Neuropathic itch: diagnosis and management. Dermatol Ther. 2013;26(2):104-9.
37. Pereira MP, Wiegmann H, Agelopoulos K, Ständer S. Neuropathic Itch: Routes to Clinical Diagnosis. Front Med (Lausanne). 2021;8:641746.

38. Reich A, Ständer S, Szepietowski JC. Drug-induced pruritus: a review. Acta Derm Venereol. 2009;89(3):236-44.
39. Grundmann SA, Ständer S. Evaluation of Chronic Pruritus in Older Patients. Aging Health. 2010;6(1):53-66.
40. Weisshaar E, Szepietowski JC, Dalgard FJ, Garcovich S, Gieler U, Giménez-Arnau AM, et al. European S2k Guideline on Chronic Pruritus. Acta Derm Venereol. 2019;99(5):469-506