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PREVALENCE OF LATERAL EPICONDYLITIS AND ITS ASSOCIATION WITH QUALITY OF LIFE AMONG CHEFS IN ISLAMABAD AND RAWALPINDI

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Abstract

Lateral epicondylitis (LE) is a recognised occupational musculoskeletal disorder (OMSD) and histologically it is a degenerative tendinosis of the common extensor origin, but there is a lack of data in relation to the chefs in Pakistan. This descriptive cross sectional study aimed at estimation of prevalence of LE and its correlation with quality of life in chefs of restaurants and hotels of Islamabad and Rawalpindi. A semi-structured questionnaire consisting of demographics items, eligibility items, the Patient-Rated Tennis Elbow Evaluation (PRTEE) and the Oxford Elbow Score (OES) were completed using non-probability purposive sampling with 377 chefs, aged between 25 and 50, (with 474 questionnaires returned, 97 excluded). Descriptive statistics and chi square tests were used to analyse data in SPSS version 29. Most participants were aged 25–34 years (67.4%), male (96.0%) and right-hand dominant (91.5%). The prevalence of LE was 11.9% (45/377; 95% CI 9.0–15.6%); 37 cases involved the right and 8 the left elbow, 43 cases were mild and 2 moderate, and none was severe. PRTEE categories were significantly associated with OES pain (χ^2 = 517.279), function (χ^2 = 452.922) and psychosocial (χ^2 = 367.498) domains (all $p < .001$). Therefore, symptomatic LE was common in this occupational group, mainly involved the right elbow, and was associated with a decrease in elbow-specific health status. Case definition was based on a self-reported instrument, and therefore, it is a probable number of cases. It is recommended to implement ergonomic and preventive programmes for chefs.

INTRODUCTION

Lateral epicondylitis (LE), commonly known as tennis elbow, is a degenerative disorder of the common extensor tendon origin, in which the extensor carpi radialis brevis (ECRB) is most often involved [1],[2]. Although the suffix "-itis" implies inflammation, histopathological studies show angiofibroblastic degeneration: fibroblast proliferation, vascular hyperplasia, disorganised collagen and micro-tears, with a conspicuous absence of neutrophils, lymphocytes and macrophages [3],[4]. The condition is therefore better regarded as a tendinosis than as a true tendon inflammation [1], and the appropriateness of the term "epicondylitis" has been questioned [5].

Typical symptoms are insidious-onset pain at or around the lateral epicondyle that may radiate along the forearm extensor mass and is provoked by gripping, resisted wrist extension and lifting; in severe cases it disturbs sleep and daily activity [1],[5]. The annual incidence in the general population is estimated at 1–3%, with smoking, obesity and repetitive motion among the recognised risk factors [6], although in most cases no obvious underlying cause can be identified [7]. Occupational exposures such as repetitive wrist and elbow movements, high handgrip force, vibrating tools and handling loads above 5 kg are recognised physical risk factors [8].

Chefs are exposed to precisely this combination of forceful grip, repetitive cutting, stirring and lifting over long shifts, usually with limited rest. Reported LE prevalence in cooks and chefs varies widely: 40% among restaurant cooks in Gujranwala, Pakistan [9]; 78.4% among restaurant chefs with low serum vitamin D [10]; and 11.5% among nursery-school cooks versus 2.5% in controls [11]. Work-related risk-factor studies among chefs in Lahore have also been published [12],[13]. However, most Pakistani studies used small samples, were restricted to men and focused on risk factors rather than on the consequences of LE for the worker's everyday life. No prevalence data were available for chefs in Islamabad and Rawalpindi.

The aims of this study were therefore (i) to estimate the prevalence of LE among chefs working in restaurants and hotels in Islamabad and Rawalpindi, and (ii) to determine whether LE is associated with elbow-specific quality of life, expressed as pain, function and psychosocial status. We hypothesised that higher PRTEE severity would correspond to worse scores in all three domains of the Oxford Elbow Score.

RESEARCH METHODS

Study Design and Setting

A descriptive cross-sectional survey was carried out over four months after approval of the research synopsis. Data were collected in 27 restaurants, hotel kitchens and mall food courts in Islamabad and Rawalpindi, including a five-star hotel, grill and barbecue restaurants, traditional (tandoori) restaurants, cafés and food-court outlets.

Participants and Sampling

The target population was practising chefs. The minimum sample size was 377, calculated with the Raosoft calculator (large population, 5% margin of error, 95% confidence level, 50% response distribution). Participants were recruited by non-probability purposive sampling. Eligible chefs were men and women aged 25–50 years, working 8–12 hours per day, with more than six months of experience [9]–[12]. Exclusion criteria were diagnosed cervical radiculopathy, recent or previous elbow or upper-limb surgery, metabolic bone disease (osteoporosis, osteomalacia), peripheral neuropathy including radial tunnel syndrome, trauma or fracture, anatomical anomaly, arthritis (osteoarthritis or rheumatoid arthritis) and cancer [10],[12],[14],[15]. Of 474 questionnaires collected, 97 were excluded and 377 were analysed.

Instruments

A semi-structured questionnaire had three parts: demographic data, eligibility screening items, and two outcome instruments. About half of the questionnaires were self-completed and half were completed by interview.

Patient-Rated Tennis Elbow Evaluation (PRTEE). The PRTEE is a 15-item questionnaire designed for LE: five pain items and ten function items (six specific and four usual activities) referring to the previous week, each scored 0–10, giving a total from 0 (best) to 100 (worst) [16]. Scores were classified as no pain (0), mild (1–30), moderate (31–60) or severe (61–100) [17]. In this study the PRTEE served as the case-identification tool: participants with a PRTEE category of mild or above were counted as LE.

Oxford Elbow Score (OES). The OES is a 12-item condition-specific questionnaire with three domains (elbow pain, elbow function and social-psychological), each comprising four items scored 0–4 (domain maximum 16) [18]. Domain scores were classified as mild (0–5), moderate (6–10) or severe (11–15). The OES was used as the quality-of-life measure, in line with the broader concept of quality of life as a person's appraisal of the different aspects of life [19].

Data Collection and Statistical Analysis

After permission from the head of department and the Institutional/Ethical Review Committee of The University of Lahore, Islamabad Campus, the questionnaire was administered at the workplace. Data were analysed with IBM SPSS Statistics version 29. Frequencies and percentages were calculated for categorical variables. The prevalence of LE is reported with a 95% Wilson confidence interval. Associations between PRTEE categories and each OES domain were tested with Pearson's chi-square test (significance level $p < .05$); Cramér's V was added as an effect-size measure.

Ethical Considerations

Ethical approval was obtained from the Institutional/Ethical Review Committee of the university. Written informed consent was obtained from all participants, participation was voluntary, and responses were kept confidential and stored securely.

RESULTS

Participant Characteristics

The 377 chefs were predominantly young: 254 (67.4%) were aged 25–34 years, 112 (29.7%) 35–45 years and 11 (2.9%) over 45 years. Most were male (362; 96.0%) and right-hand dominant (345; 91.5%) (Table 1).

Table 1: Demographic characteristics of the participants (N=377)

Characteristic	n	%
Age group (years)		
25–34	254	67.4
35–45	112	29.7
>45	11	2.9
Sex		
Male	362	96.0
Female	15	4.0
Dominant hand		
Right	345	91.5
Left	32	8.5
Total	377	100.0

n = frequency; % = percentage of total sample.

Prevalence of Lateral Epicondylitis

Forty-five of 377 chefs reported current pain on the outer side of the elbow, giving a prevalence of LE of 11.9% (95% CI 9.0–15.6%). The right elbow was affected in 37 chefs (9.8% of the sample; 82.2% of cases) and the left in 8 (2.1%); none had bilateral involvement. According to the PRTEE, 43 chefs (11.4%) had mild and 2 (0.5%) moderate tennis elbow; no participant had severe disease (Table 2). Pain frequency among the 45 symptomatic chefs was occasional in 31, frequent in 12 and rare in 2.

Table 2: Prevalence, side and severity of lateral epicondylitis (N = 377)

Variable	n	%
Current pain on outer elbow: yes	45	11.9
Current pain on outer elbow: no	332	88.1
Side of pain: right elbow	37	9.8
Side of pain: left elbow	8	2.1
Side of pain: both elbows	0	0.0
PRTEE: no pain (0)	332	88.1
PRTEE: mild (1–30)	43	11.4
PRTEE: moderate (31–60)	2	0.5
PRTEE: severe (61–100)	0	0.0

PRTEE = Patient-Rated Tennis Elbow Evaluation.

Oxford Elbow Score

Across the three OES domains, 88.1–88.6% of chefs had no problem. Mild pain was present in 40 chefs (10.6%) and moderate pain in 5 (1.3%); mild functional difficulty in 42 (11.1%) and moderate in 2 (0.5%); mild psychosocial difficulty in 34 (9.0%) and moderate in 9 (2.4%). No participant had a severe problem in any domain (Table 3).

Table 3: Distribution of Oxford Elbow Score categories, n (%)

OES domain	No problem	Mild	Moderate	Severe
Pain	332 (88.1)	40 (10.6)	5 (1.3)	0 (0.0)
Function	333 (88.3)	42 (11.1)	2 (0.5)	0 (0.0)
Psychosocial	334 (88.6)	34 (9.0)	9 (2.4)	0 (0.0)

Association between PRTEE Category and Quality of Life

PRTEE category was significantly associated with every OES domain (Table 4). Chefs without tennis elbow all had no problem in the pain domain, whereas of 43 chefs with mild tennis elbow 40 had mild and 3 moderate pain, and both chefs with moderate tennis elbow had moderate pain. Function and psychosocial domains showed the same gradient; psychosocial impairment was proportionally more frequent in mild cases (8 of 43 with moderate psychosocial difficulty) than functional impairment (1 of 43).

Table 4: Chi-square tests of association between PRTEE category and OES domains

PRTEE category vs.	χ^2	df	p	Cramér's V	Cells E<5
OES pain	517.279	4	<.001	0.83	6/9
OES function	452.922	4	<.001	0.78	6/9
OES psychosocial	367.498	4	<.001	0.70	5/9

Cells E<5 = number of the 9 cells with expected count below 5.

DISCUSSION

In this sample of 377 chefs from Islamabad and Rawalpindi, the prevalence of symptomatic LE was 11.9%, and PRTEE severity was strongly and significantly associated with poorer elbow pain, function and psychosocial scores. Because 88% of participants had no symptoms and scored "no problem" on both instruments, the very large chi-square values partly reflect this concordance of the two questionnaires. The more informative result is the graded relationship among the 45 symptomatic chefs: those with moderate PRTEE scores had moderate OES pain, and psychosocial impact was already evident in mild cases.

The prevalence found here is lower than that reported in several comparable occupational groups: 40% in restaurant cooks in Gujranwala (n = 60, men only, Cozen's test) [9], 40.6% in tandoor workers in Sargodha (n = 106) [20] and 78.4% in chefs with low serum vitamin D (n = 80, aged 20–45 years) [10]. These studies were small and restricted to men; one recruited only chefs with low serum vitamin D and one diagnosed LE with a clinical provocation test (Cozen's test) rather than a questionnaire, either of which may inflate prevalence. Our figure is closer to the 11.5% reported in nursery-school cooks, in whom epicondylitis was significantly more frequent than in controls (2.5%) [11], and to the 5.5% reported in hospital healthcare workers (n = 544) [21]. Higher values than ours were reported in computer users in Lahore (26%) [22] and in a rural working population in Korea (26.1%; n = 937), where female sex, manual labour and dominant-side involvement were associated with LE and metabolic factors were not [14]. Differences in case definition (self-reported questionnaire versus clinical test), age range, sex distribution, shift length and urban versus rural setting make direct comparison difficult.

The right-sided predominance (82% of cases) parallels the 91.5% right-handedness of the sample and is consistent with an overuse mechanism in the dominant arm, a finding also reported in rural workers [14] and computer users [22]. Hand dominance was not cross-tabulated with the affected side, so this inference remains indirect. The mild-to-moderate profile of all cases, with no severe disease, is compatible with early or intermittent tendinopathy in a young workforce (two-thirds aged 25–34 years), a stage at which workplace modification is most likely to be effective.

From a histopathological perspective, the preponderance of mild disease also matters. Degenerative tendinosis of the ECRB origin develops gradually from repetitive loading and micro-damage, with failed healing rather than inflammatory infiltration [3],[4]. Prevention in chefs should therefore focus on load management (rotation of repetitive tasks, scheduled rest, lighter or better-balanced utensils, avoidance of repeated heavy lifting) rather than on anti-inflammatory treatment alone. Not taking rest during work has been proposed as a specific risk factor in this occupation [9].

The association with quality of life is clinically relevant. Even mild LE was accompanied by pain, functional limitation and, in a few chefs, moderate psychosocial difficulty, which supports the use of patient-reported outcome measures for occupational screening. The OES, however, is an elbow-specific instrument and does not capture generic quality of life, sleep or work productivity.

Strengths and Limitations

Strengths include a sample larger than that of previous studies of chefs in Pakistan, the inclusion of women and the use of validated questionnaires. Limitations are as follows. (1) Purposive, non-probability

sampling in 27 workplaces limits generalisability. (2) Case identification relied on self-report (PRTEE and a pain question) and no clinical examination (e.g., Cozen's or Mill's test) or imaging was performed because of time constraints; the 11.9% figure therefore denotes probable symptomatic cases. (3) The sample was 96% male, so sex-specific prevalence could not be estimated. (4) Risk factors such as years of experience, working hours, smoking, diabetes and vitamin D status were not analysed. (5) The chi-square tests involved sparse tables (5–6 of 9 cells with expected counts below 5), the cross-sectional design precludes causal inference, and the two questionnaires overlap conceptually, so the strength of the association is probably overestimated; an exact test, ordinal correlation or regression adjusted for age and working hours would be more appropriate in future work.

Recommendations

Future studies should combine questionnaires with clinical tests or ultrasonography, assess occupational and metabolic risk factors, recruit more women, and evaluate ergonomic and exercise-based preventive programmes for chefs.

CONCLUSIONS

Symptomatic lateral epicondylitis affected about one in nine chefs in Islamabad and Rawalpindi (11.9%), was mild to moderate in severity and occurred mainly in the right elbow. Higher PRTEE severity was significantly associated with worse elbow pain, function and psychosocial status, indicating that LE impairs quality of life in this occupational group. Early recognition and workplace-based prevention should be prioritised for chefs.

DECLARATIONS

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Ethical approval: Approval was obtained from ethical review committee of university institute of physical therapy, University of Lahore, Islamabad campus. Informed consent was obtained from all the participants prior to data collection.

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REFERENCES

[1] A. Vaquero-Picado, R. Barco, and S. A. Antuña, "Lateral epicondylitis of the elbow," EFORT Open Rev., vol. 1, no. 11, pp. 391–397, 2016.
[2] M. Waseem, S. Nuhmani, C. Ram, and Y. Sachin, "Lateral epicondylitis: a review of the literature," J. Back Musculoskelet. Rehabil., vol. 25, no. 2, pp. 131–142, 2012.
[3] M. Cohen and G. da Rocha Motta Filho, "Lateral epicondylitis of the elbow," Rev. Bras. Ortop. (Engl. Ed.), vol. 47, no. 4, pp. 414–420, 2012.
[4] J. Nowotny et al., "Prospective randomized controlled trial in the treatment of lateral epicondylitis with a new dynamic wrist orthosis," Eur. J. Med. Res., vol. 23, 2018.
[5] D. Stasinopoulos and M. Papadopoulou, "Is lateral elbow tendinopathy an appropriate clinical diagnostic term when the condition is persistent?," MDPI, vol. 11, p. 2290, 2022.
[6] B. K. Buchanan and M. Varacallo, "Tennis elbow (lateral epicondylitis)," in StatPearls. Treasure Island, FL: StatPearls Publishing, 2019.
[7] R. Shiri, E. Viikari-Juntura, H. Varonen, and M. Heliövaara, "Prevalence and determinants of lateral and medial epicondylitis: a population study," Am. J. Epidemiol., vol. 164, no. 11, pp. 1065–1074, 2006.

[8] K. T. Palmer, E. C. Harris, and D. Coggon, "Compensating occupationally related tenosynovitis and epicondylitis: a literature review," Occup. Med., vol. 57, no. 1, pp. 67–74, 2007.
[9] M. Afzal, S. Zakaullah, S. I. Memon, A. Nisar, H. Touqeer, and H. Shabir, "Prevalence and risk factors of lateral epicondylitis among restaurant cooks at district Gujranwala: a cross-sectional study," Rawal Med. J., vol. 46, no. 2, p. 338, 2021.
[10] A. G. Memon, F. A. Latif, M. Sanaullah, M. I. Hussain, S. Irum, and F. U. Rehman, "Prevalence of lateral epicondylitis among restaurant chefs with low level of serum vitamin D," Rawal Med. J., vol. 48, no. 2, p. 422, 2023.
[11] Y. Ono et al., "Epicondylitis among cooks in nursery schools," Occup. Environ. Med., vol. 55, no. 3, 1998.
[12] F. Amjad et al., "Work-related risk factors for lateral epicondylitis in chef in Lahore," Pak. J. Med. Health Sci., vol. 17, no. 1, p. 241, 2023.
[13] M. Matloob et al., "Association of work-related risk factors and lateral epicondylitis among chefs in Lahore," Pak. J. Med. Health Sci., vol. 16, no. 8, p. 220, 2022.
[14] H. B. Park, J.-Y. Gwark, J.-H. Im, and J.-B. Na, "Factors associated with lateral epicondylitis of the elbow," Orthop. J. Sports Med., vol. 9, no. 5, 2021, Art. no. 23259671211007734.
[15] R. Y. Ikemoto et al., "Comparative study between scales: Subjective Elbow Value and Patient-Rated Tennis Elbow Evaluation applied to patients affected by lateral epicondylitis," Rev. Bras. Ortop., vol. 55, pp. 564–569, 2020.
[16] A. Cacchio et al., "Cross-cultural adaptation and measurement properties of the Italian version of the Patient-Rated Tennis Elbow Evaluation (PRTEE) questionnaire," Phys. Ther., vol. 92, pp. 1036–1045, 2012.
[17] L. Qi, Y. D. Zhang, R. B. Yu, and H. B. Shi, "Magnetic resonance imaging of patients with chronic lateral epicondylitis: is there a relationship between MRI abnormalities of the common extensor tendon and the patient's clinical symptom?," Medicine (Baltimore), 2016.
[18] T. Karjalainen et al., "Minimal important difference, patient acceptable symptom state and longitudinal validity of Oxford Elbow Score and the QuickDASH in patients with tennis elbow," BMC Med. Res. Methodol., vol. 23, no. 1, p. 158, 2023.
[19] P. Theofilou, "Quality of life: definition and measurement," Eur. J. Psychol., vol. 9, no. 1, 2013.
[20] N. Sarfraz and M. Shabbir, "Frequency of lateral epicondylitis among tandoor workers," Pak. J. Phys. Ther., 2023.
[21] K. Yanai et al., "Prevalence and factors associated with lateral epicondylitis among hospital healthcare workers," JSES Int., 2024.
[22] T. Mukhtar, M. S. Bashir, and R. Noor, "Prevalence of lateral epicondylitis among computer users," J. Riphah Coll. Rehabil. Sci., vol. 6, no. 1, pp. 47–50, 2018.