



PREVALENCE OF SMOKERS AMONG GASTROESOPHAGEAL REFLUX DISEASE PATIENTS IN WESTERN SAUDI ARABIA REGION

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ABSTRACT

Heartburn, regurgitation, vomiting, and dysphagia are among the symptoms of gastroesophageal reflux disease (GERD), which can lead to several problems. GERD has a negative influence on patients' quality of life as well as the healthcare system, which can be avoided by identifying risk factors early in life. As a result, we used this research to estimate the risk of GERD in Saudi Arabia due to smoking. In the Saudi western community, an electronic cross-sectional study was undertaken. The GERD-HRQL (GERD-Health Related Quality of Life Questionnaire) was given out at random and online. SPSS was used for the statistical analysis. The study had a total of 573 participants. Males made up 66.7% of the study participants, while females made up 33.3%. 55.5% of participants were between the ages of 18 and 30, and 6.6% were between the ages of 31 and 40. A total of 36.1% of the study participants were current smokers. Smokers reported smoking less than one pack per day 46.9% of the time, one pack per day 44.4 percent of the time, and two packs per day 7.7% of the time. Diagnosed GERD was found to be prevalent in 21.3%. The mean score of GERD symptoms among participants who were not medically diagnosed with GERD was 9.05 ± 12.8037. In addition, 51.7% had the worst heartburn symptoms, whereas 71.4% had the worst regurgitation symptoms. To summarise, smoking was linked to an increase in GERD and heartburn symptoms but not regurgitation symptoms.

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Introduction

Acid reflux, sometimes referred to as gastroesophageal reflux, is a condition in which stomach contents flow into the esophagus and/or mouth. Reflux is a natural process in healthy babies, toddlers, and adults. The majority of episodes are brief and have no unpleasant symptoms or repercussions. Heartburn, regurgitation, vomiting, and dysphagia are all symptoms of gastroesophageal reflux disease (GERD), which can lead to a variety of complications such as aspiration pneumonia, and reflux laryngitis, and, most importantly, Barrett's esophagus, which can lead to adenocarcinoma of the lower esophagus [1-4].

Mild signs and symptoms appear. Two or more days a week, or moderate to severe symptoms that occur more than once a week, are usually considered distressing and affect health-related life quality [2, 3].

The estimated prevalence of GERD in Saudi Arabia was between 23.47 percent and 45.4 percent, according to two studies that employed the GERD questionnaire (GERD Q) score of >8 as the diagnostic criteria for GERD. One retrospective study in Saudi Arabia discovered a 15% prevalence of GERD [5, 6].

The incidence of symptoms appears to be influenced by age, obesity, alcohol consumption, and cigarette smoking [7].

Under normal circumstances, the so-called antireflux barrier prevents acid stomach fluid reflux and its unpleasant effects. The most important components of this barrier are the lower esophageal sphincter (LES) tone, which is directly linked to the action of the diaphragm's crura, esophageal acid clearance, esophageal epithelial resistance, and the upper esophageal sphincter (UES) tone [8, 9].

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The LE tension is lowered during the act of smoking. After starting to smoke, the sphincter pressure reduces almost instantly, and it returns to normal within 8 minutes after the smoker has finished the cigarette. The most likely mechanism of smoking-induced lower esophageal sphincter pressure drop is nicotine blocking cholinergic receptors, resulting in the relaxing of the circular lower esophageal sphincter muscle fibers. Smoking also impairs salivary function over time, resulting in a longer period of acid elimination. As a result, smoking is likely to increase esophageal acid exposure, either by increasing the frequency of incidences of reflux or by lengthening the time it takes for esophageal acid to clear [10, 11].

The major cause of esophageal adenocarcinoma (EAC), a histological type of esophageal cancer that has been on the rise in the United States and some European countries, is gastroesophageal reflux syndrome (GERD). GERD is expensive to the healthcare system, both directly and indirectly, and has a significant impact on people's quality of life. Although the link between GERD and esophageal cancer has been examined concerning cigarettes, there is no information on the link between GERD and other tobacco-smoking products, such as water pipes [12-15].

Cigarette smoking's involvement as an exacerbating factor in the etiology of gastro-esophageal reflux disease remains unknown. While GERD is not life-threatening, it has a significant impact on health-related quality of life (HR-QOL) when compared to the general adult population and patients with other disorders such as hypertension and angina pectoris, as evidenced by the epidemiologic association between symptomatic reflux disease and cigarette smoking, which has been reported as high as 92°Zc in some series [16].

GERD has an influence on patients' and the healthcare system's quality of life, which can be avoided by detecting risk factors in the community. As a result, we used this research to assess the risk of GERD in Saudi Arabian smokers in the general population.

Materials and Methods

An electronic cross-sectional survey was conducted on 500 adult males and females in Saudi Arabia who agreed to participate in the study. Consent was obtained electronically. The GERD-HRQL (GERD-Health Related Quality of Life Questionnaire) was given out at random and online. The questionnaire was broken down into three sections: demographic questions, smoking-related questions, and GERD Health-Related Quality of Life questions (GERD-HRQL). SPSS was used for the statistical analysis. Inclusion criteria: all GERD patients in the western region, male or female, aged 18 to 80, smoker or non-smoker, and all smokers with GERD symptoms. Exclusion criteria include: smokers or non-smokers with no GERD symptoms, patients in adolescence (<18), and the elderly (>80) because this age group will not be able to cope with technology better.

Results and Discussion

Table 1 shows the sociodemographic characteristics of participants. A total of 573 people took part in the study. Males made up 66.7% of the study participants, while females made up 33.3%. 55.5% of participants were between the ages of 18 and 30, while 6.6% were between the ages of 31 and 40. As in **Table 2**, a total of 36.1% of the study participants were current smokers. Among those who smoked, 59.9% smoked cigarettes, 23.7% smoked electronic cigarettes, and 6.4% smoked water pipes. 32.9% of smokers smoked for I to 5 years, 27.1% for 5 to 10 years, and 8.4% for 10 to 15 years. 46.9% reported smoking less than one pack per day, 44.4% reported smoking one pack per day, and 7.7% reported smoking two packs per day. Prevalence of diagnosed GERD among study participants was 21.3%.

Table 1. Sociodemographic characteristics of participants (n= 573)

	Parameter	No.	%
Gender	Male	382	66.7
	Female	191	33.3
Age	18-30	318	55.5
	(31-4t)	95	16.6
	41-5fl	63	11.0
	51-fl	67	11 .7
	more then fi1	30	5.2

Table 2. Smoking status and associated factors among participants (n= 573)

	Parameter	n	%
Smoking status	Yes	207	36.1
	No	366	63.9
Tyne of smoke if smoking	Cigarettes	124	59.9

	Electronic cigarettes	49	23.7
	water-pipe	34	16.4
Smoke duration if smoking	1-5 years	68	32.9
	5-10 years	56	27.1
	10-15 years	38	15.4
	15-20 years	27	13.0
	>20 years	18	8.7
Number of cigarettes per day if smoking	<pack/day	97	46.9
	pack/day	92	44.4
	2 pack/day	16	7.7
	>2 pack/day	2	1.0
Diagnosed with GERD	Yes	122	21.3
	No	451	78.7

The mean score of GERD symptoms among participants who were not medically diagnosed with GERD was 9.05 ± 12.8 (Table 3). In addition, 51.7% had the worst heartburn symptoms, while 71.4% had the worst regurgitation symptoms (Table 4).

Table 3. Total GERD score and its association with smoking status (n= 451)

Parameter	n	%	P Value
Worst GERD symptoms	310	68.7	0.016
No GERD symptoms	141	31.3	

Mean score of GERD symptoms among participants was 9.05 ± 12.8

Table 4. Heartburn Score and its association with smoking status (n= 451)

Parameter	N	%	P Value
Worst heartburn symptoms	233	51.7	0.009
No heartburn symptoms	169	37.5	
Heartburn elimination	49	10.9	

As shown in Table 5, smoking status was linked to more GERD (P= 0.016) and heartburn (P= 0.009) symptoms, but not regurgitation symptoms (P= 0.118).

Table 5. Regurgitation Score and its association with smoking status (n= 451)

Parameter	n	%	P-Value
Worst regurgitation symptoms	322	71.4	0.118
No regurgitation symptoms	98	21.7	
Regurgitation elimination	31	6.9	

The function of smoking in the etiology of reflux disease has been hotly contested. Smoking decreases the pressure in the esophageal sphincter (LOS) and increases the risk of reflux due to strain. Smoking has been linked to an increase in the number of reflux episodes, which are attributable to deep inspiration and coughing rather than greater transitory LOS relaxations. Nicotine is most likely to blame for the effects of smoking on LOS tone and acid clearance, although the mechanisms remain unknown. Smoking cessation is unlikely to cure severe gastroesophageal reflux disease on its own; but, when accompanied by adequate pharmaceutical therapy, may be effective [17]. This is a cross-sectional study undertaken in Saudi Arabia to determine the risk of GERD among smokers in the general population.

36.1% of the participants in our study were current smokers. 32.9% of smokers smoked for 1 to 5 years, 27.1% for 5 to 10 years, and 8.4% for 10 to 12 years. 46.9% reported smoking less than one pack per day, 44.4% reported smoking one pack per day, and 7.7% reported smoking two packs per day. These findings were similar to those of recent Saudi research in which 27.2 percent of students were smokers. The number of cigarettes smoked each day ranged from 1 to 60, while the number of years of smoking ranged from 1 to 20. According to a study conducted in Saudi Arabia, 20-50 percent of smokers begin smoking around the age of 15 and release from psychological tension, boredom, and mimicking others (especially friends, siblings, and parents) are the most common reasons for smoking [18-20].

This was in line with a Saudi study that found that the prevalence of GERD was significantly greater (P<0.001) among smokers (68.3%) than nonsmokers (47.6%) [21]. This is similar to the findings of Zheng *et al.* who found a 53% increase in

the probability of frequent GERD symptoms among male participants compared to nonsmokers [22]. Smit CF, *et al.* conducted another investigation, found that the proportion of time the pH was below 4 during the smoking peril was considerably higher than the percentage of time the pH was below 4 during the nonsmoking peril, both proximal and distal to the lower esophageal sphincter [8]. Smoking causes gastro-pharyngeal and gastroesophageal reflux, according to these data. Smokers with reflux-related problems and disorders should be counseled to quit smoking to minimize reflux [23]. Another cross-sectional study in Saudi Arabia found a statistically significant link between smoking and GERD (39.3%) [5]. According to A study reported an association between waterpipe smoking and severe GERDD symptoms. The associations increased with the duration of use, intensity and cumulative waterpipe-years [24]. The HUNT study in Norway [25], which is one of the few longitudinal studies on GERD, not only showed an association between cigarette smoking and new-onset GERD symptoms but also showed a benefit from smoking cessation on GERD [26]. Tobacco smoking appears to be a risk factor for reflux symptoms, according to M. Nilsson, *et al.* [27]. The tobacco smoking data that was used in their analysis represents a lifetime exposure, making it less susceptible to reversed causation than cross-sectional exposure data. Long-term tobacco smoking is a risk factor for symptomatic GORD, as evidenced by the constant dosage response relationships between years of daily smoking and lifetime total number of cigarettes smoked and reflux symptoms. Experimental studies have demonstrated a decrease in lower esophageal sphincter pressure and an increase in the frequency of reflux episodes during tobacco smoking, which may be the mechanism behind the association [28, 29]. Successful smoking cessation improved GERD and health-related quality of life HR-QOL, according to previous research. Using subjective methods of measurement, several other research found that successful smoking cessation resulted in enhanced well-being [30, 31]. Lifestyle changes, such as quitting smoking and using PPIs, resulted in a considerable reduction in blood pressure, according to Kinoshita *et al.* [32] Aside from these studies, another one found that quitting smoking had a long-term influence on GERD and reflux symptoms. Normalization of LES pressure and saliva bicarbonate secretion after smoking cessation may contribute to GERD improvement [33].

Conclusion

To summarise, smoking was linked to an increase in GERD and heartburn symptoms but not regurgitation symptoms. Future research is needed to see if quitting smoking can improve GI symptoms in patients with condition that overlaps between GERD, heartburn, or regurgitation.

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Written & Oral informed consent was obtained from all individual participants included in the study.

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