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Analysis of Oesophageal cancer risk factors in a high-incidence region

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Abstract

One of the most common cancers that result in mortality is oesophageal cancer. The incidence, mortality, and disability-adjusted life years (DALYs) of oesophageal cancer must be better understood in order to enhance treatment and prevention. Oesophageal cancer is a well-known malignancy with a high incidence and death rate, and the prognosis is frequently dismal. Oesophageal cancer cases and deaths have considerably increased over the previous few decades. Geographic variations have an impact on the incidence rates of the two prevalent oesophageal pathological categories, oesophageal adenocarcinoma (EAC) and oesophageal squamous cell carcinoma (ESCC). The goal of this research to investigating oesophageal cancer risk factors in high-prevalence locations in order to find effective early detection and treatment strategies. Information on demographic traits, lifestyle elements, dietary practices, and medical history was gathered and examined using sophisticated statistical methods. The study revealed many important risk factors, including nutritional habits, environmental exposures, cigarette and alcohol use, and genetic propensity. It also investigated how socioeconomic factors may affect the incidence of cancer. The study shows differences in risk variables based on age groups in areas with high oesophageal cancer incidence. According to the available evidence, it is clear that environmental and behavioral risk factors significantly impact the increased incidence of oesophageal cancer in young people.

Keywords: Oesophageal, risk factor, oesophageal adenocarcinoma, oesophageal squamous cell carcinoma.

1. Introduction

Oesophageal cancer was the eighth most prevalent cancer to be diagnosed and the sixth-most prevalent cause of death globally. Nearly 85% of occurrences of this malignant tumor were found in less developed areas, which bear a disproportionately heavy burden. The

incidence and death rates were 2- to 5-fold different between both genders, with males accounting for about 70% of cases.2. Additionally, the risk of developing oesophageal cancer rises with age, and it was higher in the middle-aged and elderly population (Liu et *al.,* 2023). Oesophageal cancer incidence and death were skyrocketing due to the prevalence of risk factors like smoking, drinking, eating poorly, not exercising, and being overweight, as well as global ageing and population expansion. The prognosis for oesophageal cancer was frequently dismal since it was so aggressive (Uhlenhopp*et al.,* 2020). Oesophageal cancer has a pitiful five-year rate of less than twenty percent. However, advances have been made, increasing the survival rates to 47% and 45%, respectively, in the docetaxel-based triplet ChemoRadiotherapy for Esophageal Cancer, Followed by Surgery Study (CROSS and fluorouracil plus leucovorinoxaliplatin (FLOT). Despite these advancements, oesophageal cancer's aggressiveness and low survival rates make it a major global public health problem. It shows a significant variance in its burden between areas, disproportionately affecting less developed nations (Al-Batran*et al.,* 2019). Oesophageal cancer has two basic histologic subtypes: esophageal squamous cell carcinoma (ESCC) and esophageal adenocarcinoma (EAC).

Even though ESCC was the most prevalent kind, EAC instances were increasing. ESCC risk variables included the male gender, family history, alcohol and tobacco use, specific diets, and maybe poor oral hygiene. The risk of EAC was increased by both Gastroesophageal Reflux Disease (GERD) and obesity, with Barrett's oesophagus being recognized as early-stage cancer. Since many of the above risk factors were modifiable, public health efforts to prevent cancer development may be possible (Ghosh *et al.,* 2022). It was crucial to comprehend the epidemiological patterns of oesophageal cancer to create effective treatment and public health solutions. Due to the large disparities in incidence among populations, using high-quality cancer registry data to analyze the global burden and recent trends can help allocate resources. For specialized preventive strategies and therapeutic therapy, understanding the present prevalence and avoidable risk factors for various subtypes, including EAC and ESCC, was essential. However, little study has been done on the incidence of the disease internationally, its histological subtypes, risk variables, and current trends (Huang*et al.,* 2021). To evaluate the disproportionate impact of ESCC in high-incidence areas, we looked at possible associations between environmental and sociodemographic characteristics, lifestyle hazards, and dietary. The first epidemiologic investigation focused on the age-specific hazards for ESCC in high-incidence areas.

(Shah *et al*., 2023) thoroughly overviews approaches and developments in treating oesophageal cancer to improved patient outcomes. It covers a variety of disease-related subjects, such as diagnostic methods, therapeutic options, and novel therapeutics. (Thrift, 2021), to estimate the increased global incidence of Barrett's oesophagus and oesophageal cancer, researchers examined hazards such as obesity and gastroesophageal reflux disease (GERD). To address the expanding public health issues brought on by these disorders globally, it looks at geographical variations in disease rates and the significance of early detection and focused prevention initiatives. (Bolger*et al.,*2022)highlights the positive benefits of current developments in systemic medicines, radiation, and surgical methods on patient outcomes. It looks at promising new techniques and developing patterns that improve oesophageal cancer patients' chances of survival and quality of life. Its goal was to keep doctors and researchers updated on the most effective ways to treat cancer. (Brusselaers*et al.,* 2019) to examine whether long-term usage of proton pump inhibitors (PPIs) increases the risk of developing stomach or oesophageal cancer. Analysis of epidemiological data suggests a possible relationship between chronic PPI usage and a higher risk of developing cancer. They advise taking PPI use under careful consideration and favoring shorter-term use for safety, although

further research was required to demonstrate a clear causal link. (Obermannová*et al.,*2022), the Annals of Oncology provided a complete care protocol for oesophageal cancer. It includes an accurate diagnosis, a range of therapeutic choices, including surgery, chemotherapy, radiation, and treatments, and suggested post-treatment actions. It was useful tool attempts to improve the outcome of patients and overall illness management by providing healthcare providers with new information.

The potential role of the variable shear factor QKI in oesophageal cancer's epithelial-mesenchymal transition (EMT) was investigated by (Cui *et al*., 2023). Through in-depth analysis and experimentation, they seeks to clarify QKI's function in process, offering useful insights for prospective treatments in oesophageal cancer. (Kosumi*et al.,* 2023)to examine oesophageal cancer patient tumor samples to determine the presence and concentrations of F. nucleatum in the tumor microenvironment. They look into its connection to the immune system, perhaps affecting how cancer develops, and patients fare. They illustrates how the immune system and the tumour microbiome interact intricately in oesophageal cancer. (Damanakis*et al*., 2023) to develop a prediction tool for assessing the outcomes of neoadjuvant treatment in patients with oesophageal cancer. Neoadjuvant therapy was when treatments like radiation and chemotherapy were given before the primary treatment, such as surgery, to increase the effectiveness of the treatment. (Wallander et al., 2023) aims to identify cell-free tumor DNA and predict outcomes in patients with gastro-oesophageal cancer; they highlights the utilized of optimized, targeted sequencing. Cell-free tumour DNA analysis can provide insights into the progression and outcome of the condition, paving the way for the creation of individualized therapies and better patient care for those with gastro-oesophageal cancer. (Wang *et al.,*2023)to enhance pre-operative statistical anatomy-based T-stage evaluation for oesophageal cancer using computed tomography angiography (CTA). It explores the possibility of using CTA measurements of the major and minor axes and tumor volume to increase the accuracy of determining the primary tumor extent. The study aims to present a more reliable staging strategy for improved treatment planning and patient outcomes.

2. Materialsandmethods

Research Plan

The case-control research that matched individuals to find potential ESCC dangers in area with high incidence. Utilizing the original study's design, protocols, case definitions, and recruiting techniques, this secondary analysis sought to discover probable etiologic factors linked to ESCC in high-incidence locations.

Research Environment and Population

The study included ESCC patients with new diagnoses (age ≥ 30) determined by histology or clinical techniques. Because pathology has substantial costs, nonpathologically proven instances were also considered. Regarding sex and age (± 10 years), controls were non-cancerous patients who were matched 1:1 with cases. According to pretest probability data, the medical diagnosis of EC strongly resembles ESCC (greater than 90%).

Collection of Data

The data on exposure were gathered using interviews and structured questionnaires. These instruments were developed to record both common ESCC hazards and setting-specific hazards. The standardized questionnaires that were used and their specifics were previously disclosed. The exposure variables, which covered a wide range of topics, included sociodemographic information, home and employment history, personal and family health history, household and related treatments, hazardous dietary choices and lifestyle choices.

Analysis of the Data

In this study, the participants were split into two age categories: young age group (30 to 44 years) and old age group (under 45 years). Sociodemographic parameters and risk factors for controls and cases by age group have been analyzed using descriptive statistics. To examine the associations between every exposure and the risk of ESCC within every age categories, univariate logistic regression models (ULRM) were used. For every direction, the 95% Wald CI and the ESCC's specific-to-age odds ratio (OR) were calculated.

Utilizing MLR, the independent effects of various exposures on various age groups were assessed. The model considered exposures significantly linked to ESCC from age-stratified univariate studies, existing ESCC risk factors, design elements (age, sex), sociodemographic features (geographic area, socioeconomic position based on International Wealth Index, and established ESCC risk factors. Tobacco use, alcohol use, alcohol made at home, and daily hot beverage use were all recognized risk factors. The risk factors and connections between young (30 to 44 years) and old (under 45 years) age categories were compared in the study. The likelihood-ratio test was used to determine whether hazards significantly varied between both age categories by contrasting nested modeling with a relational term for the primary effect introduced to the age group.

Utilizing, statistical evaluations have been carried out of 9.4 in Statistical Analysis System (SAS). Statistical significance was established using a two-sided P-value of.05.It was not corrected for multiple testing across exposure.

3. Result

The investigation comprised a total of 475 ESCC patients and identical controls. In these cases, 25% of the patients were between the ages of 30 to 44, and 85% were under the age of 45. **Tables 1, 2** and **3** presented the results of the MLR analysis for the older age category (under 45 years) and the younger age category (30 to 44 years), respectively, summarizing the sociodemographic characteristics of both controls and cases, broken down by age category. Univariate analysis, which examined the specific age correlations of ESCC with sociodemographic characteristics, behavioral hazards, and household exposures, served as a guide for the selection of variables to use for the multivariate modeling. **Tables 4, 5, 6**, and **Figure 1 (a, b, c and d)** and **Figure 2 (a, b, c, and d)** to provide in-depth information.

Tables 1: The outcome of the MLR study for the younger age category (between 30 to 44 years)

Factors of sociodemographic	Younger age category (30 to 44 years)		
	Cases (M=100)	Controls (M=108)	P Value
sex			.675
Male	68 (70)	78 (73)	
Female	32 (33)	30 (27)	
Area			<.001
Central	6 (6)	5 (5)	
Lake	4 (4)	2 (2)	
Unknown			
Education			0.003
None	10(10)	2(2)	
Primary Level	70(70)	65(70)	
Secondary	10(10)	30(28)	

Postsecondary or Above	10(10)	11(10)	
Unknown			
Occupation			.002
Agriculture	40(42)	20(15)	
Business	15(17)	35(32)	
Office Work	5(7)	20(21)	
Other	40(41)	36(38)	
Unknown			
Household income, TSH			.050
< 150,000	9 (12)	1 (<1)	
150,001-500,000	9 (11)	10(12)	
500,001-900,000	15 (20)	16(20)	
900,001-1,200,000	16 (22)	12 (15)	
> 1,200,000	26 (35)	42 (53)	
Unknown	30	30	
|w|			.005
High	22 (26)	44(41)	
Medium	43 (44)	43 (40)	
Low	30 (31)	20 (19)	
Unknown	5	1	
Family history of IEC			.245
NO	95(95)	98(91)	
Yes	5(5)	10(9)	

Tables 2: Results of the MLR analysis for the older age category (≥ 45 years)

Factors of sociodemographic	Older age category (≥ 45 years)		
	Cases (M=1371)	Controls (M=363)	P Value
sex			.849
Male	265 (74)	240 (72)	
Female	115 (34)	108 (32)	
Education			<.001
None	90(9)	45(13)	
Primary Level	240(76)	205(57)	
Secondary	25(8)	70(23)	
Postsecondary or Above	10(4)	40(12)	
Unknown	5		
Occupation			<.001
Agriculture	210(59)	120(35)	
Business	25(9)	55(17)	
Office Work	30(9)	50(15)	
Other	110(31)	140(40)	
Unknown		1	
Household income, TSH			<.001
< 150,000	20(8)	20(7)	

150,001-500,000	45(19)	30(7)	
500,001-900,000	71(27)	49(19)	
900,001-1,200,000	64(24)	45(18)	
> 1,200,000	82(31)	155(55)	
Unknown	95	76	
|w|			<.001
High	75(22)	168(44)	
Medium	125(37)	98(29)	
Low	170(48)	98(28)	
Unknown	10	10	
Family history of IEC			<.001
NO	340(94)	355(98)	
Yes	28(9)	8(3)	
unknown	10	10	

Table 3: MLR-Based Risk Factors for ESCC in Each Age Group

Risk Factor	Younger age category (30 to 44 years)	Older age category (≥ 45 years)	P valu e
	aOR(94.8% CI)	aOR(94.8% CI)	
Gender			.198
Male	2	2	
Female	1.60(0.67 to 3.85)	1.25 (0.82 to 1.89)	
One Year Added To The Diagnosis's Age	1.09 (0.97 to 1.18)	1.05 (0.99 to 1.03)	
Area			.922
High (65-100)	2	2	
Medium (30-65)	1.43 (0.59 to 2.45)	1.69 (1.13 to 3.78)	
Low (0 ≤30)	2.79 (0.92 to 7.54)	1.88 (1.20 to 4.03)	
The Family's Past In EC			.024
No	2	2	
Yes	0.49 (0.07 to 3.51)	4.05 (1.38 to 10.97)	
Nicotine Use			.125
No	1		
Yes			
Alcohol			.959
No	1	1	
Yes	0.79 (0.29 to 2.11)	2.03 (1.33 to 3.12)	
Home-Brewed Booze			.377
(Any Type; Current Or Former Use)	1	1	
No	0.58 (0.22 to 1.26)	0.41 (0.23 to 0.65)	
Yes	1		
Cigarette Smoke In The Home Is Secondhand			.203

No	1	1	
Yes	1.66 (0.57 to 4.72)	2.13 (1.26 to 3.39)	
Cooking With Firewood At Home			.205
No	1	1	
Yes	1.29 (0.53 to 2.88)	1.59 (1.02 to 2.38)	
A Schedule For Brushing Teeth			.723
Daily	2	2	
Less Than Daily	9.85 (1.92 to 50.57)	1.62 (0.99 to 2.37)	
Preserved Grains And/Or Nuts			.159
No	1	1	
Yes	1.15 (0.45 to 1.67)	1.75(1.08 to 1.81)	
Nuts And/Or Grains Have Been Contaminated With			.159
Pests	No	1	
	Yes		
Daily Number Of Hot Beverages			.539
+1 Hot Drink Daily	1	1	
Less Than Daily	2.01 (1.17 to 3.52)	1.65 (1.17 to 1.27)	
Consuming Raw Vegetables			.658
Less Than Daily	1	1	
Daily	0.21 (0.07 to 0.89)	0.49 (0.22 to 0.89)	

Table 4: Analyses of the sociodemographic traits' correlations with the ESCC for each age category were based on univariate logistic regression

	Younger age category (30 to 44 years)			Older age category (≥ 45 years)		
	Cases (M=100)	Controls (M=108)	OR (94.8% CI)	Cases (M=100)	Controls (M=108)	OR (94.8% CI)
Education						
None	10(10)	8(8)	1	85(25)	48(15)	1
Primary Level	78(78)	70(65)	0.48(0.11 to 1.77)	245(68)	210(61)	0.64(0.42 to 0.94)
Secondary	15(15)	32(30)	0.18(0.05 to 0.62)	30(9)	70(24)	0.24(0.14 to 0.41)
Postsecondary or Above	10(10)	15(14)	0.20 (0.05 to 0.96)	18(8)	40(13)	0.22(0.12 to 0.42)
Unknown				3		
Occupation						
Agriculture	45(45)	25(24)	1	213(59)	125(35)	1
Business	22(22)	34(32)	0.36(0.17 to 0.75)	25(6)	55(15)	0.30(0.18 to 0.49)
Office Work	5(5)	12(11)	0.14(0.05 to 0.061)	31(9)	51(15)	0.37(0.22 to 0.59)
Other	40(40)	46(42)	0.18(0.03 to 0.096)	108(31)	141(40)	0.44(0.32 to 0.66)
Unknown					2	
TSH and household income						
Lesser than 150,000	9(9)	2(2)	1	19(8)	16(6)	1
150,001-500,000	8(8)	9(8)	0.13(0.02 to 1.13)	49(19)	29(8)	1.48(0.66 to 3.48)
500,001-900,000	17(17)	17(147)	0.15 (0.02 to 1.22)	71(26)	50(19)	1.19 (0.55 to 2.65)
900,001-1,200,000	18(18)	14(13)	0.18 (0.04 to 1.51)	64(24)	47(18)	1.15 (0.53 to 2.56)
> 1,200,000	27(27)	44(42)	0.09(0.01 to 0.68)	80(82)	155(55)	0.45 (0.22 to 0.94)
Unknown	27	30		97	78	
|w|						
High	25(26)	49(47)	1	73(22)	166 (48)	1
Medium	44(42)	42(39)	2.2(1.08 to 4.06)	128(37)	97(29)	3.08(2.09 to 4.52)
Low	32(34)	21(19)	3.56(1.56 to 6.96)	167(47)	97(29)	4.02(2.78 to 5.88)
Unknown	4	1		8	10	

history of the family in IEC						
NO	99(99)	102(96)	1	339(95)	352(100)	1
Yes	5(5)	9(8)	0.47(0.12 to 1.79)	24(9)	7(2)	4.99(1.98 to 13.22)
unknown				11	9	

Table 5: Estimations based on univariate logistic regression of the relationship between risky lifestyle behaviors and ESCC in every age category

Factor Of Sociodemographic	Younger age category (30 to 44 years)			Older age category (≥ 45 years)		
	Cases (M = 100)	Controls (M = 108)	Odds Ratio (94.8% CI)	Cases (M = 100)	Controls (M=108)	Odds Ratio (94.8% CI)
Oral Health						
Frequency Of Teeth Cleaning						
Daily	87 (85)	109(99)	1	270(74)	309(88)	1
Less Than Daily	12(13)	5(5)	4.35(1.18 to 15.99)	104(30)	54(16)	2.27(1.57 to 3.30)
Unknown				1	4	
Teeth Have Fallen Out.						
No	57(60)	55(51)	1	88(26)	115(32)	1
Yes	41(41)	57(53)	0.67(0.39 to 1.132)	282(78)	252(71)	1.42(1.04 to 1.97)
Unknown	2			2		
Smoking Status						
Current Smoking Status						
Never	62(63)	76(71)	1	168(47)	214(61)	1
Former	22(22)	19(18)	1.56(0.77 to 3.19)	137(38)	109(32)	1.62(1.62 to 2.25)
Current	20(20)	18(17)	1.52 (0.72 to 3.15)	68(17)	45(14)	2.09(1.37 to 3.22)
Unknown					2	
Chewing Tobacco (Current Or Former Use)						
No	61(62)	78(72)	1	172(48)	218(62)	1
Yes	42(42)	34(32)	1.60 (0.91 to 2.83)	203(56)	147(42)	1.77(1.32 to 2.39)

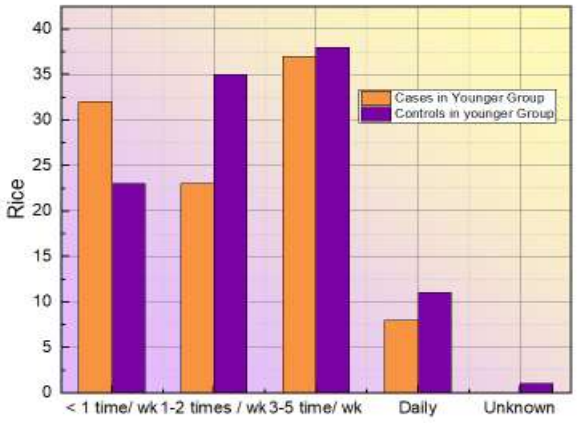
Unknown					2	
Alcohol Consumption						
Present Alcohol Consumption						
Never	46(48)	45(42)	2	144(39)	129(37)	1
Former (Last Drink > 1 Year)	29(29)	32(30)	0.91 (0.48 to 1.75)	115(32)	144(41)	0.74(0.52 to 1.05)
Current	29(29)	37(34)	0.76 (0.41 to 1.44)	117(33)	95(28)	1.14(0.79 to 1.69)
Homemade Alcohol (Any Kind, Both Current And Past Usage)						
No	73(75)	93(87)	1	191(53)	251(71)	1
Yes	27(29)	17(18)	2.07(1.04 to 4.21)	184(51)	116(31)	2.09(1.56 to 2.92)
Unknown	3	2		3		
Drinking Hot Beverages						
Daily Number Of Hot Beverages						
+1 Hot Beverage Per Day			1.83 (1.14 to 2.94)			1.39(1.08 to 1.78)
Preferred Temperature For Beverages						
Either Freezing Or Ambient	8(7)	15(14)	2	52(15)	49(15)	1
Hot Or Very Hot	95(95)	97(90)	1.84 (0.71 to 4.78)	322(89)	313(85)	0.99(0.66 to 1.54)
Number Of Tongue Or Mouth Burns In The Last Year						
Less Than 3 Times	59(59)	67(62)	1	202(56)	202(58)	1
3-8 Times	33(33)	32(30)	1.28 (0.71 to 2.35)	131(37)	141(39)	0.95(0.69 to 1.29)
≥ 9 Times	12(12)	8(7)	1.35 (0.52 to 3.49)	43(13)	24(8)	1.89(1.09 to 3.28)
Unknown				1	1	
Ate Soil Or Clay As Child						
No	78(78)	97(89)	1	316(86)	328(92)	1
Yes	20(20)	15(14)	1.85 (0.88 to 3.92)	61(18)	39(12)	1.69(1.08 to 2.63)

Previously Performed Farm Work						
No	35(35)	55(48)	1	58(15)	123(35)	1
Yes	66(66)	55(53)	1.73(0.99 to 2.95)	315(87)	244(69)	2.66(1.88 to 3.78)
Pesticide Exposure						
No	89(89)	94(89)	1	299(82)	306(86)	1
Yes	13(13)	16(15)	0.94 (0.42 to 2.08)	75(22)	59(18)	1.31(0.89 to 1.89)

Table 6: Utilizing univariate logistic regression offers evaluates of the relationship between household exposures and the incidence of ESCC in every age category

	Younger age category (30 to 44 years)			**Older age category (≥ 45 years)**		
Household Exposure	**Cases (M = 100)**	**Controls (M = 108)**	**OR (94.8% CI)**	**Cases (M = 100)**	**Controls (M = 108)**	**OR (94.8% CI)**
Secondhand tabacco smoke in the house						
No	71(72)	90(85)	1	257(70)	286(81)	1
Yes	32(32)	19(19)	2.7(1.12 to 4.19)	108(31)	78(23)	1.55(1.08 to 2.18)
Unknown	2	2		5	2	
Site for cooking						
Ventilated And Inside	62(64)	72(68)	1	168(47)	182(52)	1
Indoors, Unventilated	5(5)	2(2)	4.75(0.55 to 43.50)	12(5)	9(3)	1.65(0.67 to 4.09)
Outdoors	38(38)	38(35)	1.19(0.69 to2.12)	192(54)	176(49)	1.20 (0.91 to 1.64)
Unknown				1	2	
Cooking With Firewood At Home						
No	42(42)	67(62)	1	76(22)	144(41)	1
Yes	61(62)	44(41)	2.28(1.32 to 3.96)	296(79)	225(63)	2.59 (1.87 to 3.64)
Slept Next To A Roaring Fire When I Was A Child.						
No	47(47)	57(52)	1	112(32)	142(41)	1
Yes	58(58)	55(51)	1.29(0.76 to 2.20)	262(72)	223(63)	1.52(1.08 to 2.04)

Unknown				2		
Grain/Nut Preserved						
No	32(32)	54(50)	1	61(18)	117(34)	1
Yes	5	58(54)	1.82(1.04 to 3.18)	314(86)	249(69)	2.49(1.76 to 3.58)
Pests Have Contaminated The Grain/Nut.						
No		92(88)	1	258(72)	286(83)	1
Yes		16(16)	2.74(1.35 to 5.46)	106(31)	68(21)	1.75(1.24 to 2.48)
Unknown		4		9	14	
Water Source						
Borehole Or Well	29(29)	24(22)	1	116(32)	100(29)	1
Spring-Fed Water	0	2(2)	-	0	4(2)	-
Surface Water Or Precipitation	2(2)	1(1)	0.43(0.04 to 4.82)	14(6)	6(3)	2.38(0.89 to 5.22)
Bottled Water Or In-Home Plumbing	74(70)	79(85)	0.75 (0.40 to 1.38)	243(67)	254(72)	0.85(0.62 to 1.16)
Unknown	2				2	



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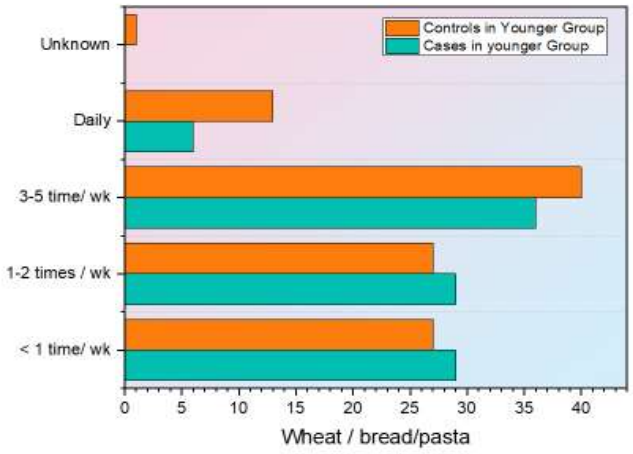
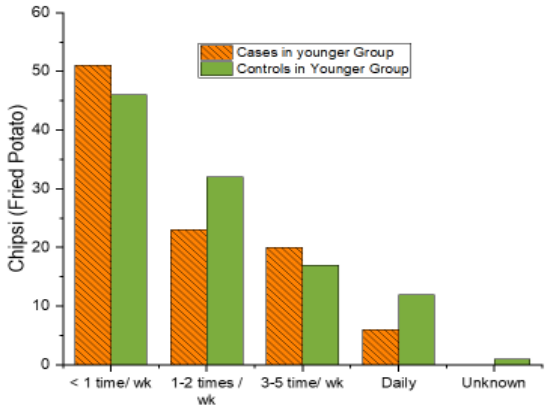
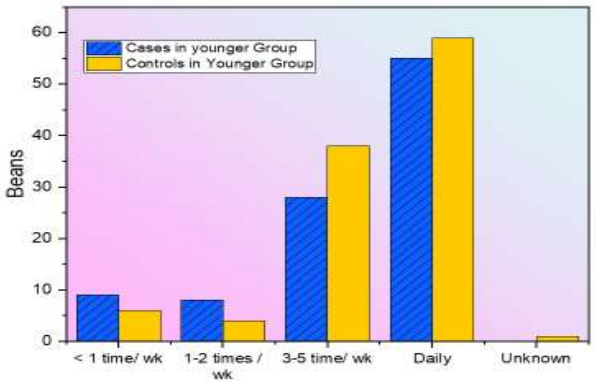


(b)

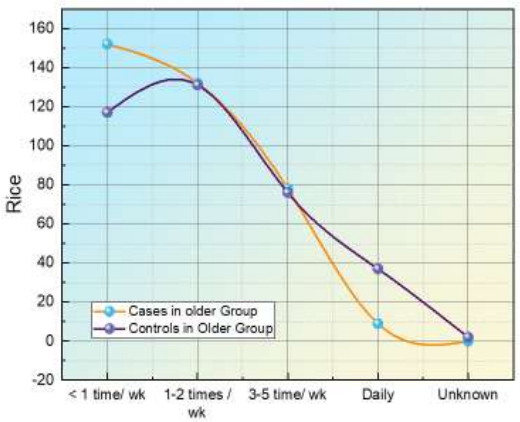


(c)

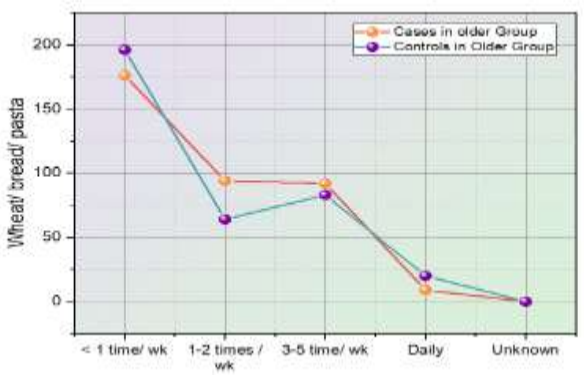


(d)

Figure 1 (a - d): *Research Findings Based on Self-Reported Food Frequency and ESCC in the Younger Age Category in Univariate Logistic Regression.*



(a)



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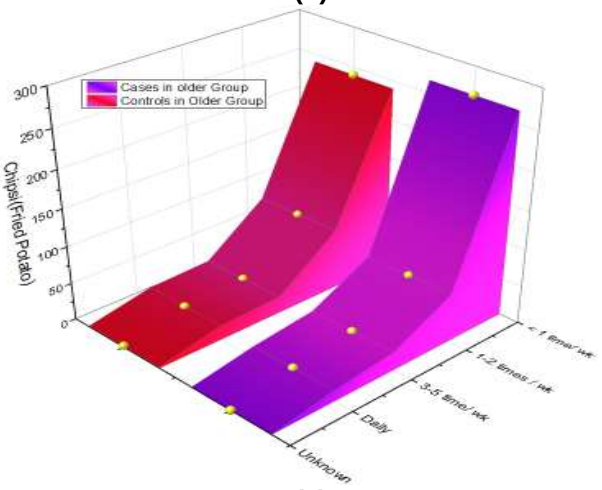

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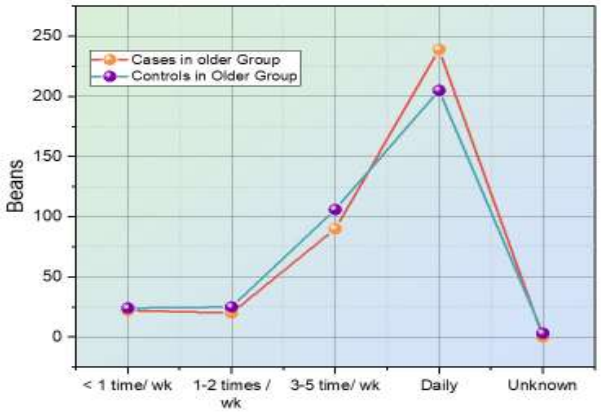

(d)

Figure 2 (a - d): *Examining Relationship Between Self-Reported Food Frequency and ESCC in the Older Age Category Using Univariate Logistic Regression***.**

Social and economic factors

A substantial risk factor in both older and younger generations appeared as the area of permanent residence. The hazards of ESCC were significantly higher for the younger age category when they resided in high-incidence areas. Living in areas with high incidence rates was associated with improved hazards of getting ESCC among those who were older. Furthermore, there were substantial differences between both of their age groups in how the area affected the risk of ESCC.

Individual Wealth Index (IWI) scores of moderate or lower were linked to a higher risk of ESCC in the older age group. When other factors were considered, a similar trend was seen in the younger age categories, although it does not achieve statistical significance. Additionally, there was a significant difference in the effects between the two age categories, with an

increased hazard for oesophageal cancer in older age categories but not in the younger age categories being linked to a family history of the disease.

Risk factors for behavior

The lifestyle risk behaviors examined, such as drinking, smoking, and using home-brewed alcohol, did not demonstrate a link with a higher risk of ESCC in younger ages. Interestingly, current or past alcohol consumption appeared to develop a protective effect in the older age category, whereas tobacco consumption was connected to a higher incidence of ESCC. However, home-brewing alcohol was linked to a higher incidence of ESCC in the elder age group.

Less frequent tooth brushing was linked to an elevated risk of ESCC for oral hygiene habits in younger but not older. Additionally, a dose-response connection between daily hot beverage consumption and an increased risk of ESCC in both age categories was discovered. On the other hand, both older and younger ages showed a protective effect against ESCC from daily ingestion of raw greens.

Family Exposures

When the older age group did not exhibit this association, household use of secondhand smoke was linked to a higher hazard of ESCC in the younger age category. In contrast to the younger age category, and the older age category showed an increased hazards of ESCC as a result of using firewood for cooking grain and/or nuts stored at home were linked to higher likelihood of ESCC in the older age group, but not in the younger age group. The younger population had a greater incidence of ESCC, which was linked to early pest control of grains and/or nuts, despite the fact that this connection was not found in the older age category.

4. Discussion

In this investigation, a number of exposures were found as potential hazards for oesophageal, such as pest control of nuts and grains, poor oral hygiene, use of alcoholic beverages, and secondhand smoking exposure. Overall, we found that the age group affected the influence of risk factors differently. These results indicate that over the course of a person's lifetime, the corresponding significance of certain hazards for ESCC in high-incidence areas can change, most likely as a result of variations in exposure patterns by latency and the duration of the influence.

This research was initial comprehensive epidemiological analysis of the hazards for ESCC in high-incidence areas. This study expanded on past research that identified different epidemiologic trends contributing to the significant prevalence of ESCC in young people by exploring other potential risk factors. Ethnicities an oesophagealcancer diagnosis in the family and consumption of hot beverages have all been linked to the disease in previous studies in the area. The current investigation, however, discovered that family history was just a risk factor for the older age group, indicating that genetic variables may not be major causes of early-onset disease. Both age groups showed a link between frequent hot beverage use and an elevated risk of early-onset ESCC. Further research is necessary because it was discovered that poor oral hygiene, particularly infrequent teeth brushing, is linked to an increased risk of developing early-onset ESCC.

Dietary factors also contributed to the likelihood of developing ESCC, with consumption of raw greens having preventative benefits in both age groups. However, procedures for storing grains and nuts were linked to higher risk in the older population, which led to further investigation of probable pollutants or infestations. It was shown that ESCC incidence rates varied geographically, with some areas having a higher risk than others. Young ESCC cases predominated in the area, which raised concerns regarding the allocation of hazards in this area. While tobacco use was linked to secondhand smoke exposure in the older group, it emerged as a hazard in the younger age category. Notably, smoking was not a significant hazard for early illness. Alcohol consumption did

not appear to significantly increase the chance of developing early-onset ESCC.

It is critical to recognize the study's limitations, which include using national referral centers for participant recruitment, self-reporting of exposure, and excluding persons under the age of 30. The analysis was also constrained by a small amount of early-onset ESCC cases, and possible variations in unrestricted factors between age categories would affect the analysis of age-specific effects.

This study's findings, which highlight the effects of hot beverage use, oral hygiene practices, and dietary habits, offer crucial information on the risk hazards of early-onset ESCC in areas with a high frequency. Geographical variations suggest that local risk factors require more investigation, while genetic factors are less important in early-onset disease. These results establish the framework for future studies to create focused prevention and intervention measures and advance our understanding of the ESCC etiology in the area.

5. Conclusion

Young people were particularly impacted by oesophageal squamous cell carcinoma (ESCC), making it an ideal opportunity to look into the underlying risk factors. Our research shows that there may be more than one contributing risk factor to the high prevalence of early oesophageal cancer. Investigation of possible connections between these risk factors and their replication is crucial. The lack of a relationship between an oesophageal cancer diagnosis in the family and early-onset disease is particularly remarkable. An ongoing multisite genome-wide association study has promise for adding more information to the discussion of the potential for genetic susceptibility in this patient population. More investigation and analysis are required to comprehend the complicated nature of ESCC in children fully.

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