Student's Journal of Health Research Africa
Vol. 4 No. 9 (2023): September 2023 Issue
https://doi.org/10.51168/sjhrafrica.v4i9.648
Original article

A COHORT STUDY OF POST-GASTRIC-RESECTION GASTRIC-CANCER SURVIVORS AT INCREASED RISK FOR PSORIASIS.

Amit Kumar[a], Anuja Bharti[b,*]

[a] *Senior Resident, Department of Medicine, All India Institute of Medical Sciences, Patna, Bihar, India*
[b] *Senior Resident, Department of Skin & VD, Government Medical College & Hospital, Purnea, Bihar, India*

Abstract.

Objective:

This objective of this investigation was to draw comparison between psoriasis risk factors and incidence between the general population and gastric cancer patients who had undergone gastrectomy.

Methods:

The hazard ratio (HR) and incidence of onset psoriasis were determined by comparing 140 survivors of gastric cancer for seven years to 300 matched controls from the general population. In gastric cancer survivors, we also estimated the HRs for psoriasis in accordance with obesity, vitamin B12 supplementation and adjuvant cancer treatment.

Results:

The gastric cancer group was less likely than the controls group to have dyslipidemia. 1.64 per cent and 16.62 per cent of gastric cancer survivors received chemotherapy and radiotherapy, respectively.

Conclusion:

In conclusion, gastrectomy-treated gastric cancer survivors had a lower incidence of psoriasis than matched controls.

Recommendation:

A 4-week break is recommended between courses of potent or very potent corticosteroids. Methotrexate is recommended for the treatment of moderate to severe psoriasis in adults and is less effective than adalimumab and infliximab for cutaneous psoriasis.

Keywords: Psoriasis, psoriatic arthritis, periodontitis, inflammation, Submitted: 2023-09-05, Accepted: 2023-09-22

1. Introduction.

Gastric cancer is the third most common cancer in women and second in men within Asia and internationally [1]. Late-stage stomach cancer symptoms and indicators indicate that the disease has advanced. Wealthy nations have a five-year survival rate below 30%, whereas impoverished nations have 20% [2]. Gastric cancer made about 8.6% of 2002 cancer cases. China, Japan, some Latin American countries and Eastern Europe have higher stomach cancer rates. Caucasian people in India, North America, Africa, the Philippines, Australia, and Western Europe are low risk [2]. India estimated 35,675 novel stomach cancer cases in 2001, 23,785 in men and 11,890 in women [3]. Many factors affect incidence rates,

* Corresponding author.
Email address: anuja.bharti1301@gmail.com (Anuja Bharti)

but Helicobacter pylori infection and diet are key.

Psoriasis is a complex autoimmune skin condition characterised by abnormal skin lesions. The estimated prevalence of the condition in the general population of Western nations is between 2% and 3% [1, 2]. Red, inflamed skin and scaly plaques are common symptoms of psoriasis. Joint deformations and disability can be caused by more severe complications, such as inflammatory arthritis. Patients with psoriasis typically report a low health-related quality of life and are subjected to significant social stigma [3-5]. Systemic inflammation related morbidities are associated with psoriasis [6], including obesity, cardiovascular disease, diabetes, and metabolic syndrome. In addition, malignancy risks are particularly of concern for psoriasis patients, as immunosuppressive treatments and psoriasis' chronic systemic inflammation may be associated with elevated cancer risks.

Several large cohort studies and recent meta-analyses have documented an elevated susceptibility to malignancies in individuals with psoriasis [7-10]. Additionally, a study conducted in Korea has specifically emphasised the heightened risk of stomach cancer in this population [11]. However, it is important to note that there is a scarcity of information about relative risks and occurrence of psoriasis among individuals with cancer in comparison to the general population. The findings of a community-based cohort study conducted in Sweden revealed a 17% increased psoriasis risks among individuals with breast cancer when compared to the general population [12, 13]. However, there currently exists a lack of research investigating the potential psoriasis risks in patients with other types of cancer. The potential for psoriasis occurrence among individuals who have survived cancer may vary in comparison to the general population due to the influence of immunosuppressive cancer treatments and cancer cells, on the patients' immune system. These factors have the potential to alter the immunopathogenesis of psoriasis.

The study's aim was to examine the comparative incidence rates and risks of psoriasis among individuals who have undergone gastrectomy for stomach cancer, in comparison to the general population.

2. Methods.

2.1. Study design and population.

The data for this retrospective cohort study was extracted from the database of tertiary care centre in Purnea, Bihar, India. A cohort of 649 individuals was enrolled in the study, all of whom had undergone either complete or subtotal gastrectomy for the treatment of stomach cancer throughout the time frame of seven years.

2.2. Eligibility Criteria.

Exclusion criteria encompassed patients lacking health check-up data or with a pre-existing medical history of psoriasis or either different cancer type prior to their diagnosis of gastric cancer. Furthermore, we choose to remove individuals who experienced mortality or the onset of psoriasis within a three-year timeframe following gastrectomy, as the immediate impact of the surgical procedure would not be observed in such cases. In this investigation, 140 individuals diagnosed with stomach cancer were enrolled.

The control group consisted of 2180 cancer-free subjects whose ages and sexes were matched to those of the 1649 gastric cancer patients. Using data from the year when the patients were diagnosed with, both control cases and gastric cancer incident cases were matched on a yearly basis. The equivalent baseline characteristics were derived from the previous year. Similar exclusion criteria were applied to both the gastric cancer group and the control group. 300 matched controls were designated an index date corresponding to the date of gastrectomy of their matched gastric cancer patients.

The main outcome was psoriasis incidence. Antipsoriatic drug codes (such as biologics, topicals, and systemics) and L40 code were used to define psoriasis. Participants were observed from the index date till psoriasis development, died before the censored date.

2.3. Statistical Analysis.

Using descriptive statistics, the baseline characteristics of the sample are presented. To evaluate psoriasis risks according to gastrectomy status, a Cox regression analysis was undertaken and adjusted for sex, age, residence, income, hypertension, smoking, diabetes, body mass index, dyslipidemia, alcohol etc. In order to examine chemotherapy and radiotherapy effects on likelihood of psoriasis. Analysis of HRs of psoriasis in the cancer survivors was conducted, according to adjuvant cancer treatment. Stratified analyses were conducted based on BMI to determine if obesity influenced the psoriasis development in patients with gastric cancer. The data of this study were analysed using SAS version 9.4 (SAS Institute, Cary, North Carolina, United States). p-values below 0.05 were regarded as statistically significant. The analysis algorithms are described in detail in the online supplementary material.

3. Results.

3.1. Sample characteristics.

The clinical and demographic characteristics of both groups- gastric cancer and matched controls are displayed in Table 1. Their average age was 57.59 ±0.16 years, and 33.76 per cent of the sample was female. Gastric cancer patients were more prone to have hypertension, diabetes, a low BMI and alcohol consumption when compared to the control group. The control group was more prone to have dyslipidemia when compared to the gastric cancer group. 16.62 per cent of gastric cancer survivors and 1.64 per cent received chemotherapy and radiotherapy, respectively.

After a 3-year delay, the average duration of follow-up for the entire sample was 3.84 yrs (3.86 years for controls group and 3.77 years for gastric cancer group). 300 of the 2,180 matched controls compared to 140 of the 649 gastric cancer patients developed psoriasis during follow-up period. The multivariable-adjusted hazard ratios (aHRs) for psoriasis incidence in patients without and with gastric cancer were 0.83 and 0.84, respectively. Only gastric cancer participants who had undergone subtotal gastrectomy had lower psoriasis risks compared to control group when psoriasis risks were evaluated by surgery types. Adjuvant cancer treatment analyses revealed that radiotherapy and chemotherapy have no influence on psoriasis risk.

In order to investigate BMI effects on development of psoriasis, psoriasis incidence was compared among patients not obese (BMI ≤ 25 kg/m^2), who were obese (BMI >25 kg/m^2). Regardless of whether being obese or not, psoriasis incidence in gastric cancer group, particularly those who had undergone subtotal gastrectomy, was quite low when compared to the control group.

4. Discussion.

In this study, a decreased psoriasis incidence in the survivors' group was unrelated to obesity. Numerous case reports demonstrated psoriasis to have enhanced swiftly following gastrectomy as a bariatric procedure for obese people with psoriasis [14-16]. Nevertheless, even within the subset of individuals who were not obese (with a BMI <25 kg/m^2), there was a significant decrease in the likelihood of developing psoriasis among survivors of gastric cancer. Furthermore, this lower psoriasis risk was consistently observed only in gastric cancer group who had undergone partial gastrectomy, as opposed to whole gastrectomy. In comparing the incidence of psoriasis following subtotal gastrectomy between individuals in the baseline non-obese group (BMI≤25 kg/m^2) and obese group (BMI > 25 kg/m^2), it was observed that the former group exhibited a lower occurrence of psoriasis. However, it is important to note that the metabolic and surgical procedure advantages associated with gastrectomy for gastric cancer patients are comparable to those of bariatric surgery. Consequently, the impact of weight loss resulting from gastrectomy or gastrectomy does not appear to be a significant determinant in the reduction of risk for psoriasis.

Psoriasis incidence was 15 per cent lower in the gastric cancer group compared to controls group. Subtotal gastrectomy for more than 3 years was found to be associated with a decreased psoriasis

Table 1: **Baseline characteristics**

Variables	Control group (300)		Gastric cancer survivors (140)	
	Frequency	Percentage	Frequency	Percentage
Age	58.27 ± 11.11		58.92 ± 11.23	
Sex				
Male	195	65%	93	66.43%
Female	105	35%	47	33.57%
BMI	24.04 ± 3.02		23.82 ± 3.08	
Residence				
Urban	255	85%	123	87.86%
Rural	45	15%	17	12.14%
Diabetes	60	20%	31	22.14%
Hypertension	126	42%	60	42.86%
Dyslipidemia	78	26%	32	22.86%
Radiotherapy	0	-	5	3.57
Chemotherapy	0	-	26	18.57%

Table 2: **Psoriasis in controls and gastric cancergroup due to obesity**

Group	**Number**	**HR**	**aHR**
BMI <25 kg/m ^{2}			
Matched controls	195	1	1
Gastric cancer survivors	94	0.87	0.86
Subtotal gastrectomy	75	0.87	0.86
Total gastrectomy	19	0.88	0.87
BMI ≥25 kg/m ^{2}			
Matched controls	105	1	1
Gastric cancer survivors	46	0.84	0.84
Subtotal gastrectomy	38	0.83	0.83
Total gastrectomy	8	0.90	0.88

risk among the survivors' group, whereas obesity chemo/ radiotherapy, and total gastrectomy had no effect on this risk.

Two recent meta-analysis studies found psoriasis patients with high H. pylori infection rate in psoriasis patients with more severe effect [17-19]. These studies demonstrated a notable correlation between H. pylori infection & psoriasis, suggesting that H. pylori infection induces an abnormal immunological cascade to contribute to pathogenesis of psoriasis. This study also indicates a correlation between H. pylori infection & psoriasis [20] did not discover such notable association between the two, but their conclusion was limited because it was based on cross-sectional research that spanned only one year.

5. Conclusion.

In conclusion, gastrectomy-treated gastric cancer survivors had low psoriasis incidence than the controls group. Subtotal gastrectomy was correlated with low psoriasis risks in patients with gastric cancer for more than 3 years. Our findings indicate that H. pylori infection induces an abnormal immunological cascade to contribute to pathogenesis of psoriasis. To evaluate the effects

of subtotal gastrectomy on psoriasis onset in patients with gastric cancer and identify biological mechanisms underlying this process, additional research is required.

6. Limitations.

The limitations of this study include a small sample population who were included in this study. The findings of this study cannot be generalized for a larger sample population.

7. Recommendation.

A 4-week break is recommended between courses of potent or very potent corticosteroids. Methotrexate is recommended for the treatment of moderate to severe psoriasis in adults and is less effective than adalimumab and infliximab for cutaneous psoriasis.

8. Acknowledgment.

We are thankful to the patients; without them the study could not have been done. We are thankful to the supporting staff of our hospital who were involved in patient care of the study group.

9. List of abbreviations.

HR- hazard ratio
BMI- body mass index
aHR- adjusted hazard ratios

10. Source of Funding.

This study was not funded

11. Conflict of interest.

The authors report no conflicts of interest in this work.

12. Publisher details:

Publisher: Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256775434261
Location: Wisdom Centre, P.O.BOX. 148, Uganda, East Africa.

13. References.

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018;68:394-424. Erratum in: CA Cancer J Clin 2020;70:313.
2. DeSantis CE, Lin CC, Mariotto AB, Siegel RL, Stein KD, Kramer JL, et al. Cancer treatment and survivorship statistics, 2014. CA Cancer J Clin 2014;64:252-271.
3. Jung KW, Won YJ, Kong HJ, Lee ES. Cancer statistics in Korea: incidence, mortality, survival, and prevalence in 2016. Cancer Res Treat 2019;51:417-430.
4. Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, Nikšić M, et al. Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. Lancet 2018;391:1023-1075.

5. Jung KW, Won YJ, Kong HJ, Oh CM, Shin A, Lee JS. Survival of Korean adult can- cer patients by stage at diagnosis, 2006-2010: national cancer registry study. Cancer Res Treat 2013;45:162-171.
6. Lee JW, Ali B, Yoo HM, Park CH, Song KY. Conditional survival analysis in Korean patients with gastric cancer undergoing curativegastrectomy. BMCCancer2015;15:1005.
7. Shin DW, Yoo SH, Sunwoo S, Yoo MW. Management of long-term gastric cancer survivors in Korea. J Korean Med Assoc 2016;59:256-265.
8. Shin DW, Ahn E, Kim H, Park S, Kim YA, Yun YH. Non-cancer mortality among long-term survivors of adult cancer in Korea: national cancer registry study. Cancer Causes Control 2010;21:919-929.
9. Shin DW, Suh B, Lim H, Suh YS, Choi YJ, Jeong SM, et al. Increased risk of osteoporotic fracture in postgastrectomy gastric cancer survivors compared with matched controls: a nationwide cohort study in Korea. Am J Gastroenterol 2019;114:1735-1743. Erratum in: Am J Gastroenterol 2020;115:150.
10. Choi YJ, Shin DW, Jang W, Lee DH, Jeong SM, Park S, et al. Risk of dementia in gastric cancer survivors who underwent gastrectomy: a nationwide study in Korea. Ann Surg Oncol 2019;26:4229-4237.
11. Christophers E. Psoriasis–epidemiology and clinical spectrum. Clin Exp Dermatol 2001;26:314-320.
12. Davidovici BB, Sattar N, Prinz J, Puig L, Emery P, Barker JN, et al. Psoriasis and systemic inf lammatory diseases: potential mechanistic links between skin disease and co-morbid conditions. J Invest Dermatol 2010;130:1785-1796. Erratum in: J Invest Dermatol 2010;130:2517.
13. Boyman O, Conrad C, Tonel G, Gilliet M, Nestle FO. The pathogenic role of tissue-resident immune cells in psoriasis. Trends Immunol 2007;28:51-57.
14. Gaspari AA. Innate and adaptive immunity and the pathophysiology of psoriasis. J Am Acad Dermatol 2006;54(3 Suppl 2):S67-S80.
15. Bos JD, de Rie MA, Teunissen MB, Piskin G. Psoriasis: dysregulation of innate immunity. Br J Dermatol 2005;152:1098-1107.
16. Takeshita J, Grewal S, Langan SM, Mehta NN, Ogdie A, Van Voorhees AS, et al. Psoriasis and comorbid diseases: epidemiology. J Am Acad Dermatol 2017;76:377-390.
17. Pouplard C, Brenaut E, Horreau C, Barnetche T, Misery L, Richard MA, et al. Risk of cancer in psoriasis: a systematic review and metaanalysis of epidemiological studies. J Eur Acad Dermatol Venereol 2013;27 Suppl 3:36-46.
18. Kimball AB, Schenfeld J, Accortt NA, Anthony MS, Rothman KJ, Pariser D. Cohort study of malignancies and hospitalized infectious events in treated and untreated patients with psoriasis and a general population in the United States. Br J Dermatol 2015;173:1183-1190.
19. Chiesa Fuxench ZC, Shin DB, Ogdie Beatty A, Gelfand JM. The risk of cancer in patients with psoriasis: a population-based cohort study in the health improvement network. JAMA Dermatol 2016;152:282-290.
20. Reddy SP, Martires K, Wu JJ. The risk of melanoma and hematologic cancers in patients with psoriasis. J Am Acad Dermatol 2017;76:639- 647.e2.
21. Jensen P, Egeberg A, Gislason G, Thyssen JP, Skov L. Risk of uncommon cancers in patients with psoriasis: a Danish nationwide cohort study. J Eur Acad Dermatol Venereol 2018;32:601-605.
22. Lee JW, Jung KJ, Kim TG, Lee M, Oh J, Jee SH, et al. Risk of malignancy in patients with psoriasis: a 15-year nationwide populationbased prospective cohort study in Korea. J Eur Acad Dermatol Venereol 2019;33:2296-2304.
23. Cho SI, Lee H, Yang MS, Cho SJ, Lee DH. Inverse association between Helicobacter pylori infection and atopic, skin, and autoimmune diseases: a nationwide population-based study in South Korea. Allergy 2021;76:3824-3826.