Upper Gastrointestinal Symptoms and Climate Exchange in Indonesian Hajj Pilgrims: Community Based Study, Islamic Year 1427

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ABSTRACT

Background: Upper gastrointestinal symptoms rank among the three most common diseases for Indonesian hajj pilgrims in last 4 years. The prevalence was 22-34% per hajj season. Most of the cases were dyspepsia syndrome and Gastro Esophageal Reflux Disease (GERD). The internal risk factor of Upper gastrointestinal symptoms is largely known, but not for external factor such as environment and climate.

Aim: To examine the association between climate exchange and upper gastrointestinal symptoms

Methods: Dynamic population of 204,941 Indonesian Hajj Pilgrims in Islamic year 1427 were included for this study. Multiphase screening in Indonesia found the prevalence of upper gastrointestinal symptoms was 3.32%. Prospective follow up for upper gastrointestinal symptom-based on community health services (flight group/kloter and maktab policlinic/polimaktab) and hospital base (Sub Balai Pengobatan Haji Indonesia, Balai Pengobatan Haji Indonesia [BPHI] and Saudi Arabia hospital) was conducted in Saudi Arabia.

Results: The incidence rate of the upper gastrointestinal symptoms was 2.4 per mile (95% CI = 1.8 -3.1). There was no significant difference among male and female p = 0.279 (95% CI = 0.18- 5.3) and there was significant difference among work area (Daker) p = 0.001 (95% CI = 50.4-182.5). There was no significant correlation between upper gastrointestinal symptoms and temperature or humidity in 3 work area (p = 0.155) Mecca, Medina and Jeddah.

Conclusion: There was no significant correlation between climate exchanges to the upper gastrointestinal symptoms.

Keywords: upper gastrointestinal symptoms, Indonesian Hajj Pilgrims, dyspepsia, GERD

INTRODUCTION

Upper gastrointestinal symptoms are common in the community, with approximately 40% of the population having these symptoms in a given 6-month period.[1,2] This problem therefore represent a significant problem in the community. The most common upper gastrointestinal symptoms are dyspepsia and GERD (Gastro Esophageal Reflux Disease).[3]

Dyspepsia is defined pragmatically as upper abdominal or retrosternal pain, with or without other symptoms thought to be arising from the upper gastrointestinal tract-which is the approach that has been generally adopted by epidemiological studies. It has been suggested that dyspeptic symptoms can be categorized as ulcer-like, reflux-like and dismotility-like as indices to underlying cause.[4] The annual prevalence of dyspepsia in western countries is approximately 11 - 25 %[4,5,6] and the condition accounts for 2-5% of all primary care physician referral.[6,7]

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GERD is defined as a disorder in which recurrent gastric contents reflux into the oesophagus causing troublesome symptoms and/or complications. Typical symptoms of reflux are heartburn and acid regurgitation. Chest pain, belching, nausea, dysphagia, early satiety and epigastric pain as well as some extraoesophageal symptoms are also associated with GERD. The prevalence of GERD in the Asian-Pacific region < 5%, is much lower than in western countries which is > 20%.[8] Clinical symptoms are useful in the western population because the population is familiar with the terminology. For Asian population include Indonesia, there is lack of proper translation of the word "heartburn" in most languages, causing the diagnosis difficult to make.[9] Heartburn defined as a burning sensation behind the breast bone (a burning sensation often starting in the epigastric region and radiating retrosternally).[1]

Upper gastrointestinal symptoms ranks among the 3 most common diseases for Indonesian hajj pilgrims in last 4 years. Most of the cases were dyspepsia syndrome and GERD.

The internal risk factor of upper gastrointestinal symptoms is largely known. Lifestyle and genetic factors dominate the etiology of upper gastrointestinal symptoms. In previous epidemiologic studies of relatively small sample size some individual risk factor was or was not associated with upper gastrointestinal symptoms, but we did not know contribution of external factor such as environment and climate in large population base. We investigated association between environment (such as climate exchange) and increased frequency of upper gastrointestinal symptoms.[14,15]

METHODS

In Islamic year 1427 (2006) a community based screening for 204,941 Hajj Pilgrims was conducted. The study population was subject who reported pain or discomfort in the upper part of abdomen with or without other symptoms thought to be arising from the upper gastrointestinal tract were classified as having dyspepsia and subject with heartburn classified as GERD. Multiphasic screening for the hajj pilgrims recent year found the prevalence of upper gastro-intestinal symptoms was 3.32%. More than 85% among the patients were dyspepsia and GERD. Based on multiphasic screening we followed the daily incidence of upper gastrointestinal symptoms in hajj season reported by three work area; Daker Jeddah, Medina and Mecca. The methods used in this study are hybrid design (mix ecological study) between ecological and prospective study.

STATISTICAL ANALYSIS

The statistical analysis sought to identify difference between/within subject and to explore the relationship between external risk factor (work area and climate exchange) and upper gastrointestinal symptoms in the community. Prevalence estimates are reported along with corresponding 95% confidence interval. Descriptive statistics for numerical scale such as age, daily incidence, temperature and humidity are reported as either mean and standard deviation (SD). The latter statistics are reported when the distribution of a given measure is substantially skewed. Assessment of external risk factor used multiple linier regression analysis. Unit analysis was daily incidence of upper gastrointestinal symptoms.

RESULT

Demographic characteristic of patients who complained upper gastrointestinal symptoms representing all the hajj pilgrims are presented in table 1. The age range was 12-90 years old, and women accounted for 71.6% of study population.

Table 1. Demographic characteristic of Multiphasic screening with proportion upper gastrointestinal symptoms by sex

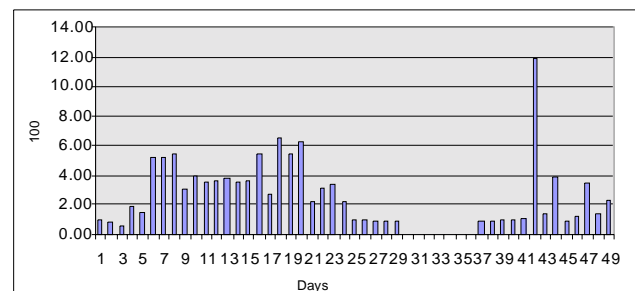| Characteristics	Male	Female
Age, mean $\pm$ SD, y†	52.4$\pm$11.24	51.7$\pm$11.8
Upper GI Symptoms, %	28.4	71.6

Figure 1. Incidence rate of the upper gastrointestinal symptoms by day per 1,000 pilgrimages in Indonesian hajj pilgrims 1427 hajj season
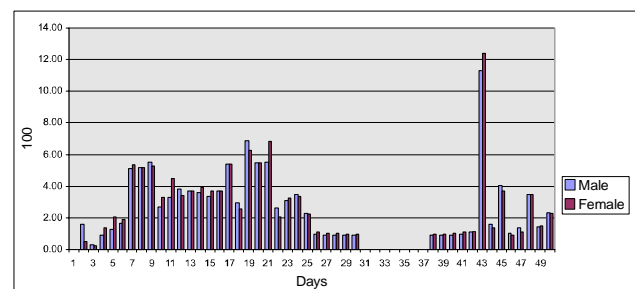

Figure 2. Incidence rate of the upper gastrointestinal symptoms and rate by sex per 1,000 pilgrimages in Indonesian hajj pilgrims 1427 hajj season

Table 2. Independent determinant by work area

Determinant	Jeddah	Medina	Mecca
Prevalence, % $\pm$ SD	2.04$\pm$3.4	15.07$\pm$19.8	6.7$\pm$9.8
Temperature, min, $\pm$ SD, $^{\circ}$C	20.6$\pm$2.7	12.6$\pm$4.1	19.9$\pm$2.6
Temperature, max, $\pm$ SD $^{\circ}$C	29$\pm$1.5	23.6$\pm$7.4	30.5$\pm$2.6
Temperature Difference, $\pm$ SD $^{\circ}$C	8.6$\pm$2.3	11.6$\pm$5.3	10.5$\pm$3.1
Humidity, min$\pm$ SD	39.5$\pm$9	26.3$\pm$6.4	36.8$\pm$9.4
Humidity, max,$\pm$ SD	54.1$\pm$8.8	43.6$\pm$10.9	49.6$\pm$13.7
Humidity difference $\pm$ SD	16$\pm$8.4	16.9$\pm$12.3	12.3$\pm$11.02

The incidence rate of the upper gastrointestinal symptoms was 2.4 per mile (95% CI = 1.8-3.1). The next following graphics presents the daily incidence of upper gastrointestinal symptoms based on gender. There was no significant difference among male and female p = 0.279 (95% CI = 0.18-5.3).

The prevalence of upper gastrointestinal symptoms presented in flight group and BPHI during 50 days was 8.8% (18,067/204,941), on average 85% of these patients were registered with dyspepsia and GERD.

Table 2 presented independent determinant by work area and statistical analysis found there was significant difference among work area (Daker) p = 0.001 (95% CI = 50.4-182.5). Independent determinant showed that Medina have the highest prevalence. There was a different temperature and humidity in Medina which was lower than Mecca and Jeddah. However, statistical analysis found there was no significant correlation between upper gastrointestinal symptoms and temperature or humidity in three work area of Mecca, Medina and Jeddah (p = 0.155).

DISCUSSION

The concept of upper gastrointestinal symptom is particularly useful when discussing diseases of the gastrointestinal tract. The concept applies to the muscular organs of the gastrointestinal tract esophagus, stomach, and small intestine. The muscles of the organs or the nerves that control the organs are not working and function normally.[10,11]

Classification of upper gastrointestinal symptom were set to be used clinically by physician, this is important in primary care settings, as most upper gastrointestinal symptom are detected and managed in primary health services[12] in Indonesia, flight group and sub BPHI as a one day care services in Saudi Arabia.

Multiphase screening in Indonesia found the prevalence of upper gastrointestinal symptoms was 3.32% lower than prevalence in Western Europe and America (20%) but it same with the prevalence in Asia (< 5%). Most of the cases were dyspepsia syndrome and GERD

In the recent year the prevalence of upper gastrointestinal symptom in Saudi Arabia among Indonesian hajj pilgrims was 22-34%, similar with population rate 11-40% respectively. Medina has the highest prevalence (15.07%). Eighty five percent of the cases were dyspepsia syndrome and GERD. Gastrointestinal symptoms were most frequently reported by female patients whose age more than 50 years old.

Pathogenesis of the upper gastrointestinal symptoms is multifactor and more complex. Internal risk factor of upper gastrointestinal symptoms is largely known. Lifestyle and genetic factors dominate the etiology of upper gastrointestinal symptoms.[10,13] External risk factor such as temperature and humidity triggered increased frequency of upper gastrointestinal symptoms.[14,15] Some study found relationship between environment and climate exchange due to increase health outcome

Medina has different climate compared Mecca and Jeddah but analysis found there was no contribution of external factor such as environment and climate exchange to increase frequency of upper gastrointestinal symptoms for the Indonesian hajj pilgrims.

CONCLUSION

There was no significant correlation between climate exchanges to the upper gastrointestinal symptoms. The findings of this study are important for the development of upper gastrointestinal symptoms prevention program, which incorporates individual modification due to climate.

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