

Analysis of risk factors for Helicobacter pylori infection in the Maltese population

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BACKGROUND

To assess risk factors for Helicobacter Pylori Infection in the Maltese population.

METHODS

A total of 138 patients undergoing OGD investigation were contacted by telephone and asked a series of questions relating to their H.pylori status, demographics, and the various risk factors under investigation. The main variables under consideration were as follows; smoking status, alcohol status, and socioeconomical status. Data for H.pylori positive and negative individuals was analysed for significance using Chi Squared.

RESULTS

From the 138 respondents 50 were found to be CLO positive whilst 83 were found to be negative. From the positive cohort 62% were found to be non-smokers whilst 38% were found to have previously smoked, and 16% were found to be alcohol consumers (≥ 3 drinks a week), whilst 84% were non-drinkers. The percentages in the negative cohort were as follows; 59.5% non-smokers and 40.5% smokers, whilst 21.4% were alcohol consumers and 78.6% were not. The cohort was divided into six geographic districts (northern harbour, southern harbour, south east, northern, western, and Gozo) with the % of positives being 18%, 30%, 24%, 14%, 14% and 0%, whilst the negatives were 27.4%, 19%, 16.7%, 14.3%, 21.4%, and 1%. Socioeconomic status was assessed based on government pay scales for occupation. Of the positives 79% were \geq to grade 10 whilst 21% were $<$ grade 10. For negatives the percentages were 77.8% and 22.2% respectively.

CONCLUSION

Thus, it can be seen that there was no significant difference in the incidence of the aforementioned risk factors in the positive and negative cohorts.

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INTRODUCTION

The purpose of this study was to assess the potential risk factors for *Helicobacter Pylori* in the Maltese population. To this end a cohort of patients who underwent endoscopy in Mater Dei Hospital were all assessed for; smoking status, alcohol intake, socio-economic status, and geographic location and gender, and these were compared against their *H.pylori* status.

METHODOLOGY

Participants were recruited from the endoscopy lists of a General Surgeon practicing at Mater Dei Hospital. All participants had undergone oesophago-gastroduodenoscopy between July 2018 and January 2019. Patients were contacted via telephone and asked regarding the following criteria;

- Age
- Locality
- Job
- Diagnosis following OGD
- Smoking status
- Alcohol intake over a week
- Alcohol type

The data collected was split into unmatched negative and positive lists, and assessed for significant differences using the Chi Square test. Localities were grouped into 6 standardised statistical districts. Jobs were classified according to the 20 Government Pay Scales and grouped into above or equal to grade 10, and below grade 10. Individuals who were listed as housewives were omitted from analysis based on the fact that other sources of income (e.g. partner income) would have been difficult to account for.

A total of 72 females and 66 males were contacted, of whom 28 and 22 were positive respectively. Smoking status was divided into non-smokers, ex-smokers, and smokers. Alcohol status was classified as drinker (at least 3 drinks a week or weekend binge) and non-drinkers. 3 drinks a week were used as this would represent a drink/day for at least half the week, whilst a weekend binge was assumed to represent a similar amount of alcohol intake. As respondents were unable to exactly quantify their intake, this measure has been taken to account for this fact. It should be noted that alcohol type was not analysed as the vast majority of respondents claimed mixed intake with no particular preference.

RESULTS

From the 50 participant positive cohort we found that 31 were non-smokers, 8 were ex-smokers, and 11 were current smoker. On the other hand, from the 84 participant negative cohort we found 50 non-smokers, 20 ex-smokers and 14 current smokers. This resulted in a P value of 0.491 at a confidence interval of 95%. (Figure 1)

With respect to alcohol intake, in our positive cohort we had 8 drinkers as opposed to 42 non-drinkers, whilst in our negative cohort there were 18 drinkers and 66 non-drinkers, resulting in a P value of 0.442. (Figure 2)

The cohort was divided into six geographic districts (northern harbour, southern harbour, south east, northern, western, and Gozo) with the positive and negative participants being distributed as follows. In the northern harbour district; 9 positives and 23 negatives, southern harbour district; 12 positives and 16 negatives, south east district; 12 positives and 14 negatives, west district; 7 positives and 12 negatives, and in Gozo 0 positives and 1 negative. The P value for the above data was

found to be 0.395. It is worth noting that the number of respondents from Gozo was very small due to the fact that the majority of Gozitans elect to undergo OGD at Gozo General Hospital. (Figure 3)

Socioeconomic status was assessed based on government pay scales for occupation. Of the positives 29 were \geq to grade 10 whilst 8 were $<$ grade 10. For negatives the percentages were 49 and 14 respectively, resulting in a P value of 0.944. (Figure 4)

From the individuals called 28 females and 22 males were in the positive cohort, whilst 44 females and 40 males were part of the negative cohort. Consequently the P value concerning the association of gender and *H.pylori* risk was found to be 0.684. (Figure 5)

The total sample was split into various age groups, with the positive and negative members being as follows; 16-25 (2,4), 26-35 (6,5), 36-45 (4,13), 46-55 (7,12), 56-65 (18,20), 66-75 (9,22), and 76-85 (4,7). The P value for the association between age and the incidence of *H.pylori* was found to be 0.181. (Figure 6)

Figure 1 Non-Smokers vs Smokers vs Ex-smokers

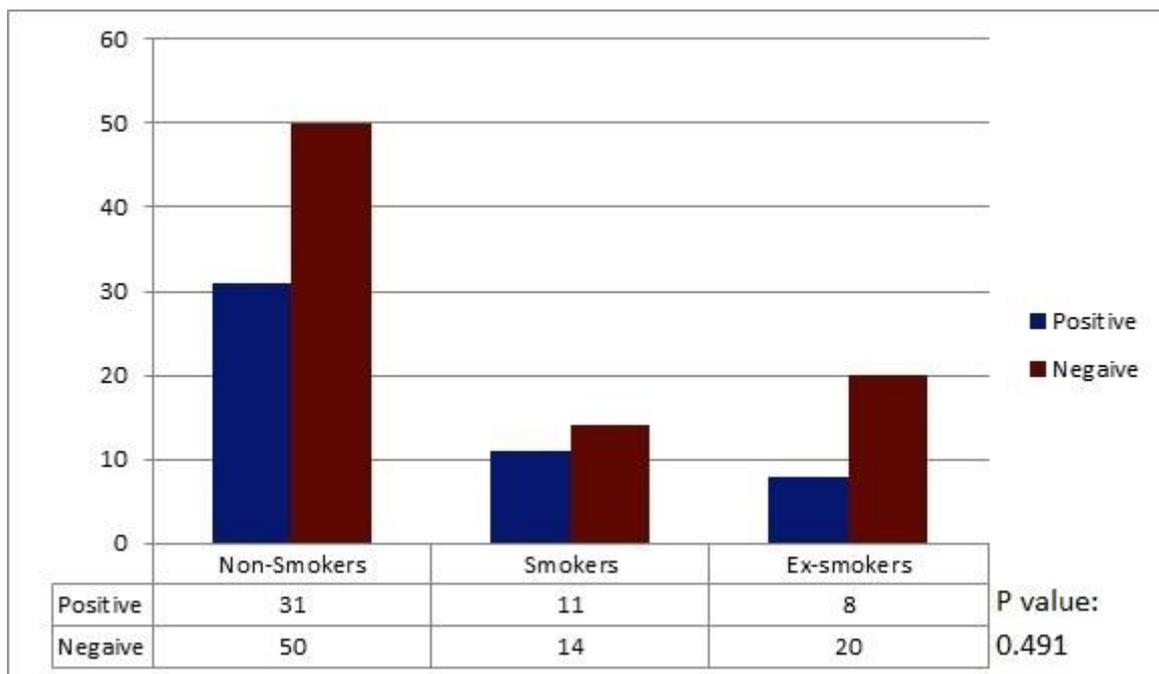


Figure 2 Alcohol Drinkers vs Non-Drinkers

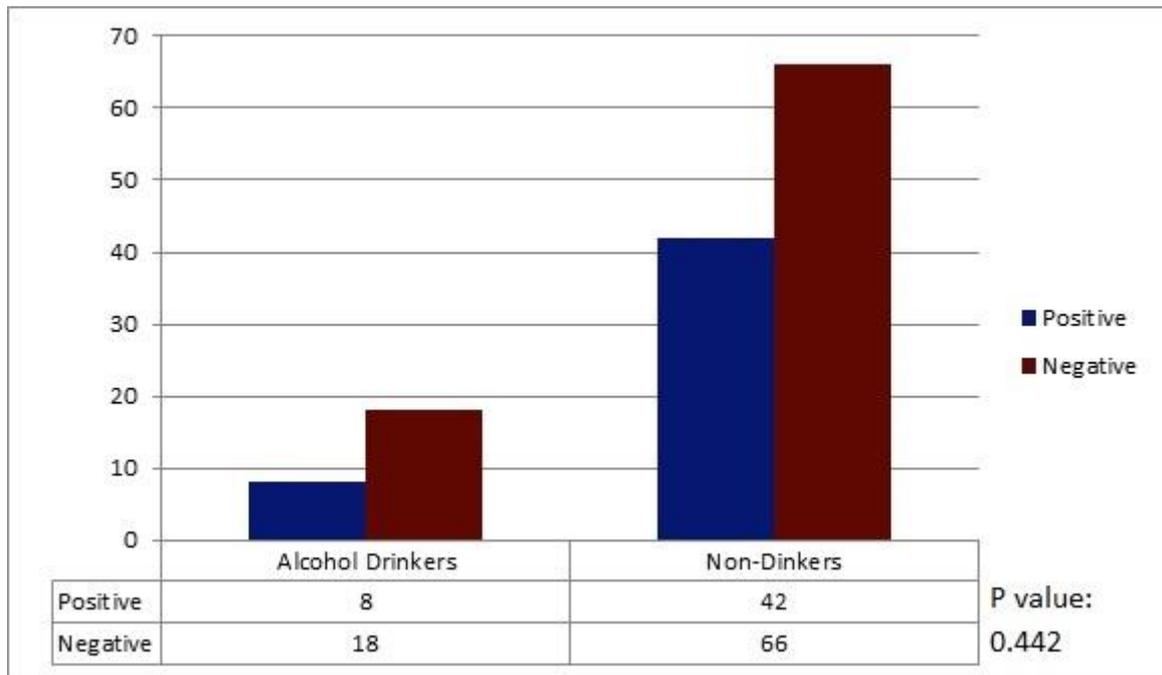


Figure 3 Geographic Distribution

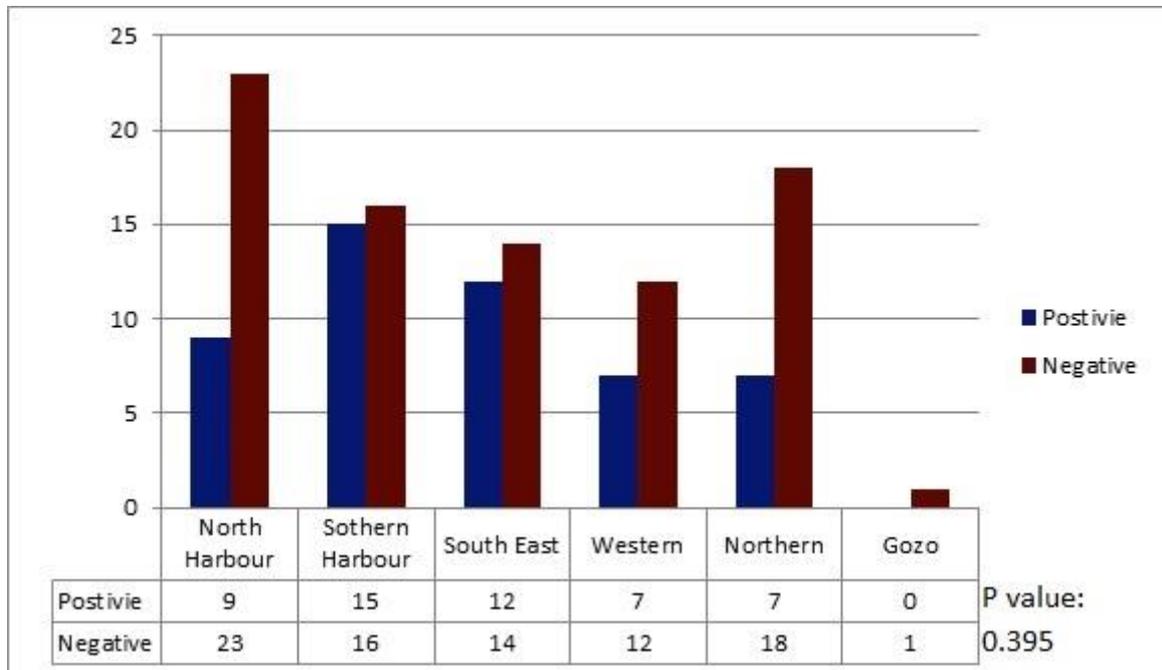


Figure 4 Socioeconomic Status

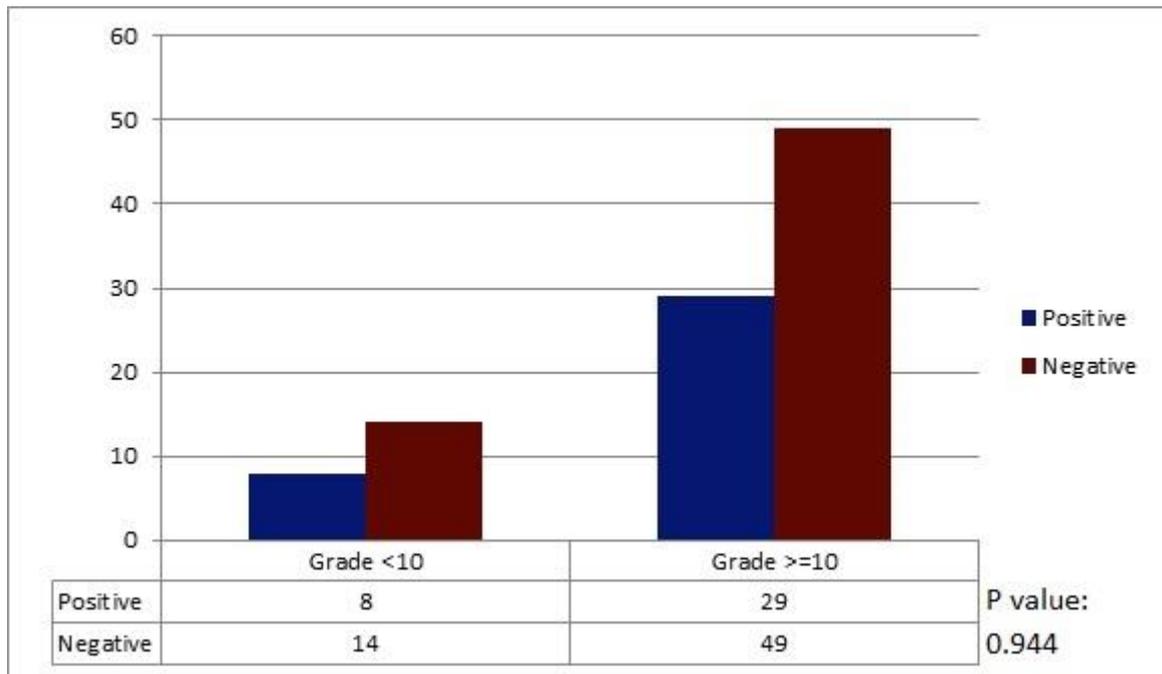


Figure 5 Male vs Female

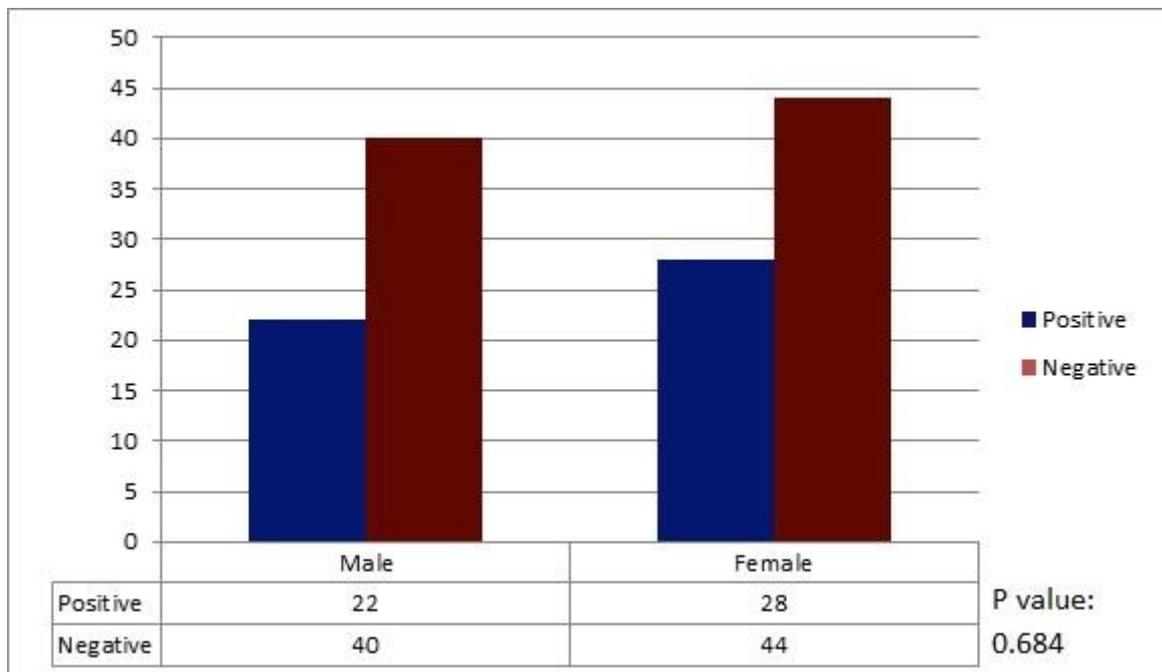
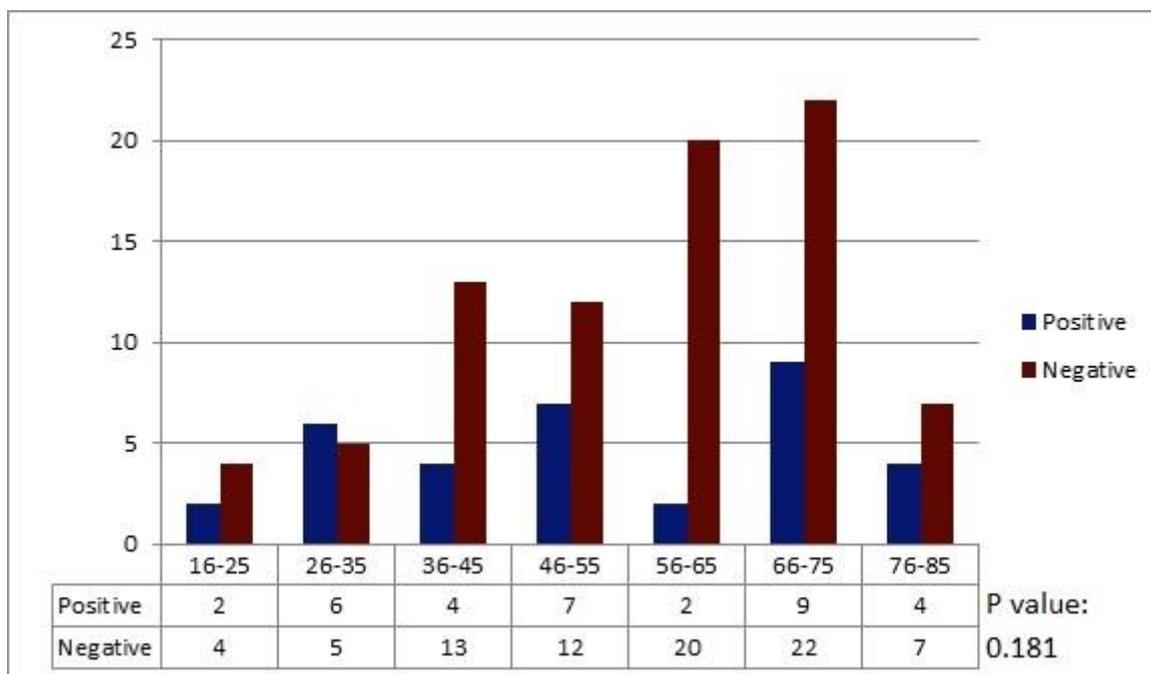


Figure 6 Age Groups



DISCUSSION

As stated above no relationship was found between smoking and *H.pylori* infection, however various other studies have been performed which found either a positive relationship, negative relationship or no relationship at all.¹⁻³ The low number of smokers overall, and the minimal difference in numbers between the positive and negative cohort, made it difficult to ascertain the effects of quantity. The number of cigarettes consumed per day has been previously been shown to have a negative association with *H.pylori* infection.² We were also unable to assess the amount of potential second hand exposure to cigarette smoke. It is thus wholly possible that there exists interplay between these factors that masks the effects of smoking on the prevalence of infection. Therefore it stands to reason that further more in-depth study is merited to assess the exact relationship between various forms of

smoking, smoke exposure, cigarette consumption and *H.pylori* risk.

With respect to alcohol consumption the results are largely the same as those for smoking, with various papers both being concordant with our results whilst others quote possible positive or negative relationships with *H.pylori* infection.⁴⁻⁶ An interesting variable mentioned in other papers was the effect of the type of alcohol consumed on the protective effects of alcohol.⁷ In this study we were unable to accurately assess the effects of alcohol type due to limitations of sample size and the lack of variation in alcohol preference between respondents. A larger sized study may be merited to look into whether or not alcohol type influences the potential negative or positive relationship with *H.pylori*.

Socioeconomic status is a commonly quoted potential risk factor for *H.pylori* infection in numerous studies.⁸⁻⁹ However in this study, we

were unable to find any link between income, geographical distribution and CLO positivity. The reason for this may lie in the fact that Malta hosts a densely packed population, where the differences in income, housing conditions, and education may be less pronounced than in the larger countries. In these countries the difference of poverty and wealth are far more pronounced, and there is a greater likelihood that groups of individuals of similar socioeconomic status will reside within the same geographical areas. Consequently, one finds discrepancies in the quality of life, and social determinants of health, within these areas.¹⁰

CONCLUSION

From the above data it can be concluded that there is no relationship between *H.pylori* infection and age, gender, locality, socio-economic status, alcohol use and smoking status within the Maltese population. This is in keeping with the limited and conflicting studies performed thus far into *H.pylori* risk factors, and thus further highlights the need for large scale studies encompassing a broader range of potential risk factors for *H.pylori* infection.

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SUMMARY BOX

Known about this subject:

- *H.pylori* infection inferred to be linked to alcohol and smoking as all three are often related to the development of gastrointestinal ulcers.
- Socioeconomical status is a known risk factor for infection
- Contradicting evidence regarding the link between *H.pylori* and cigarette smoking and quantity of alcohol intake
- Some evidence exists regarding a protective effect of certain forms of alcohol

Findings:

- No socioeconomic discrepancy could be found in this study
- No relationship between smoking and *H.pylori*
- No effect of alcohol quantity on the risk of *H.pylori* infection
- No geographical discrepancies in the rate of *H.pylori* positivity at OGD

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