Would Lactate Dehydrogenase (LDH) be an Important Predictor for the Development of Heart Disease for Macau Adults Aged 35 or Above? ------ Result from a Five Year follow-up Study in Macao

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BACKGROUND

- Macao was an ex-colony of Portugal and returned to China in 1999. Most of health related data came from clinical visiting data until 2006.

- Heart disease was the second killer in Macao population.

- LDH would be released during heart or other body tissue damage.

- In 2006, a random household sampling health survey was jointly conducted by the Health Bureau of the Macao SAR and the Macau Polytechnic Institute. A total of 3119 residents aged 18 or above participated in the survey.

- In 2011, 2395 of 3119 participants were followed by phone interview and gave a response rate of 76.8%.

- This report is based on the results of the five year follow up and present the five year self reported incidence of heart disease and explore the risk factors related to the incidence among the people aged 35 and above.

STUDY AIMS

- 1. Presenting the five year self-reported incidence of the heart disease in 2011.

- 2.Presenting the mean score of lactate dehydrogenase (LDH) for those whose age 35 above in 2006 .

- 3. Exploring the relationship between heart disease incidence and LDH as well as other related variables.

- 4. Conducting multivariate analysis to find out the most significant predictors for the heart disease.

METHODOLGY

- A total of 3119 adults were randomly recruited for the Macao Health Survey in 2006. Data was collected by health assessment, questionnaires and laboratory tests.

- Total of 2395 participants were followed up in 2011. Through phone interview, their health status were collected using a questionnaire.

- Heart disease status in 2011 was defined by answering "yes" for the question: " If a doctor has told you that you had a Ischemic heart disease or coronary disease or angina (mainly manifested by chest pain on exertion)?".

- LDH was obtained through lab test from the fasting samples.

- After excluding those who had heart disease and aged below 35 in 2006, a total of 1527 cases were included in the analysis.

- The IBM-SPSS version 20 was used for data analysis.

DEMOGRAPHIC IN 2006 SURVEY (n=1527)

Mean Age:	**49.2±9.52**
(Range)	**(35 – 86)**
Sex:	
Males	**41.3%**
Females	**58.7%**
Education:	
Primary school or below	**34.7%**
Middle school	**54.9%**
Diploma or above	**10.4%**
Monthly median Income	
Individual	**4001-8000 MOP***
Household	**8001-12000 MOP**

* MOP, Macao currency, 8 MOP = 1 USD

RESULTS

- In 2011 follow up study, the five year self reported incidence of heart disease was 4.0 %. Females had higher incidence than males but no statistical significance achieved. (4.4% vs. 3.5%, p=0.395) However, the incidence rate increased with the age basically. (age and sex stratified figure showed on next slide)

- In the MHS2006, mean value of LDH was 312.76±55.9.

Five Year Incidence of Heart Disease Stratified by Age and Sex
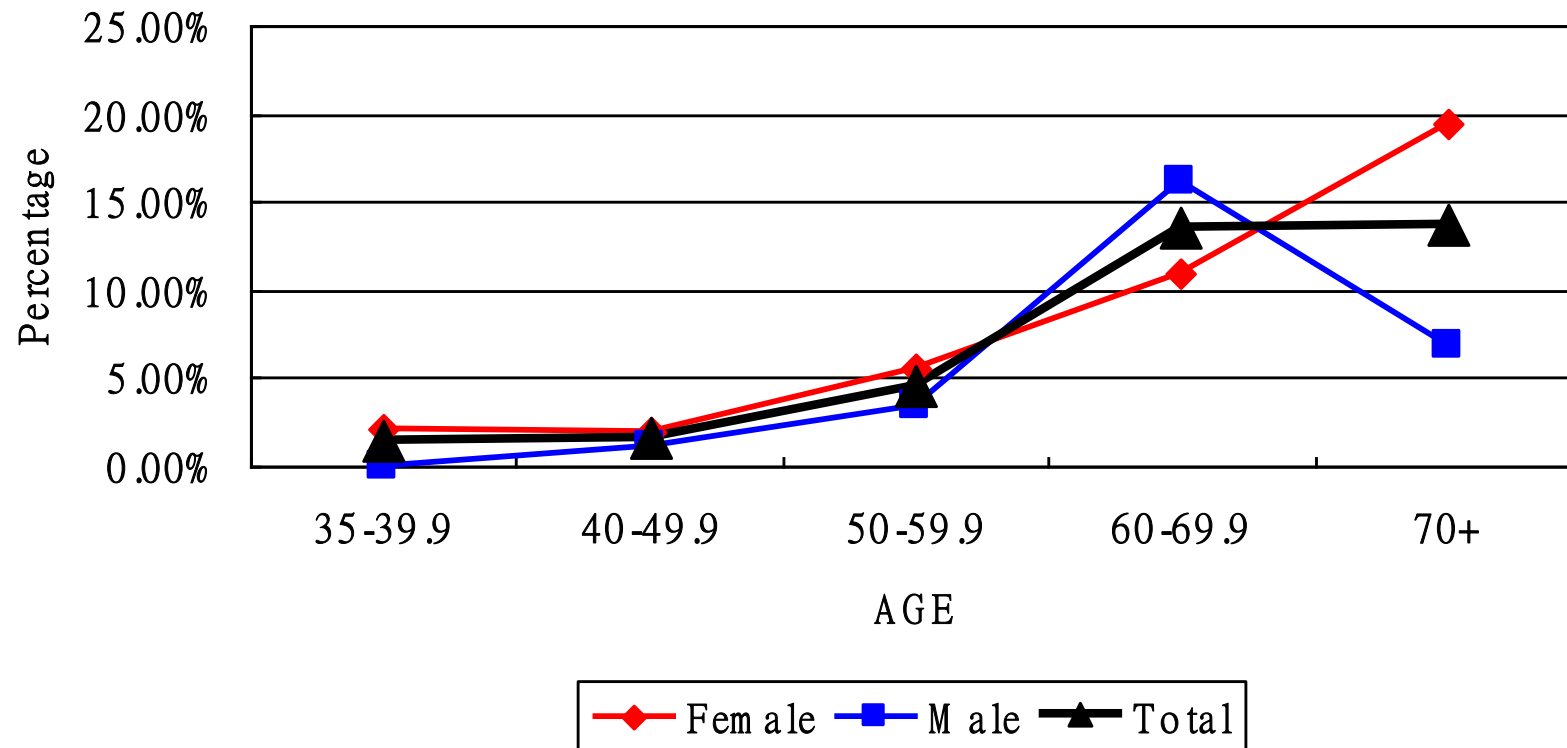
RESULTS-2

- Higher heart disease incidence was found in the people with hypertension and osteoporosis, who didn't drink alcohol, and see no herbal practitioners. They were also had lower education level and individual incomes. Compared to those without the disease, the new cases of the heart disease in 2011 had higher mean values in age, LDH, MCHC, SBP in the 2006 health survey.

Heart Disease Incidence in Demographic and Disease Variables
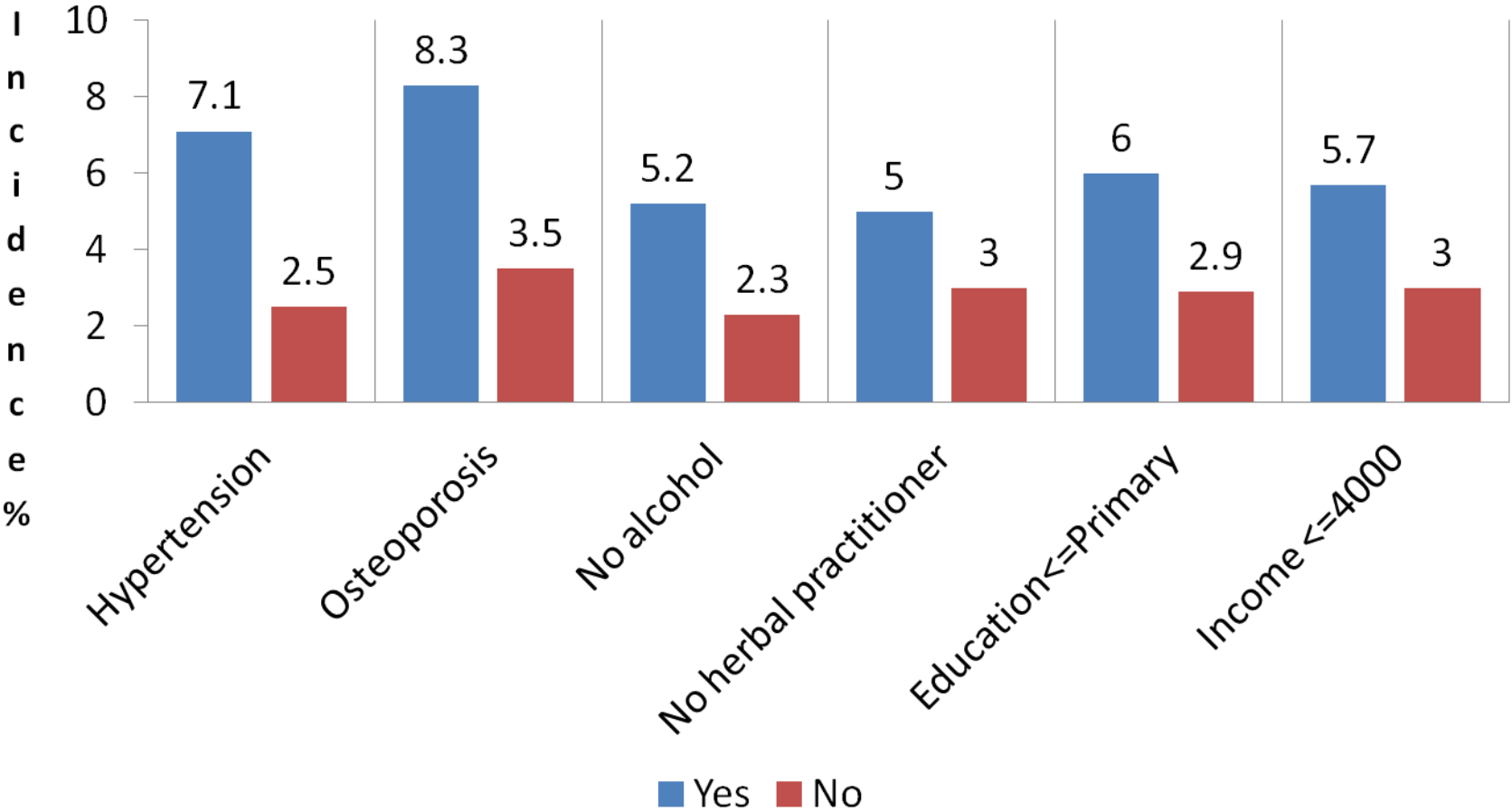
Mean Difference Between People with and Without Heart Disease in the Numeric Variables

Variables	Heart Disease N=61	Non Hypertension N=1464	P Value
	Mean±SD	Mean±SD	
AGE	57.5±10.9	48.9±9.3	.000
LDH (Lactate Dehydrogenase)	339.4±68.8	311.7±55.0	.000
MCHC (Mean Corpuscular Hemoglobin Concentration)	34.6±.76	34.4±.91	.049
SBP	141.7±26. 5	126.9±20.8	.000

RESULT (Multivariate Analysis)

In logistic regression with heart disease incidence as dependent variable and all significant variables listed above as independent variables, we found age, LDH, and alcohol intake in 2006 health survey were significantly predictors for the heart disease in 2011.

VARIABLES In 2006	Odds Ratio	95.0% C.I. for OR (low	high)
Age	1.075	1.050	1.100
LDH (Lactate Dehydrogenase)	1.007	1.003	1.012
Alcohol Intake	.494	.249	.981

Limitation of the Study

- The phone follow up in self-reported method could have under reported the incidence, but it may lead to a conservative estimation for risks and the relationship between the heart disease and identified variables were still valid.

CONCLUSION

- In our analysis samples, incidence of heart disease was 4%. After adjusting the effects from other co-variances, increased LDH would predict the development of heart disease several years later.

- Thank you

- Any Questions?