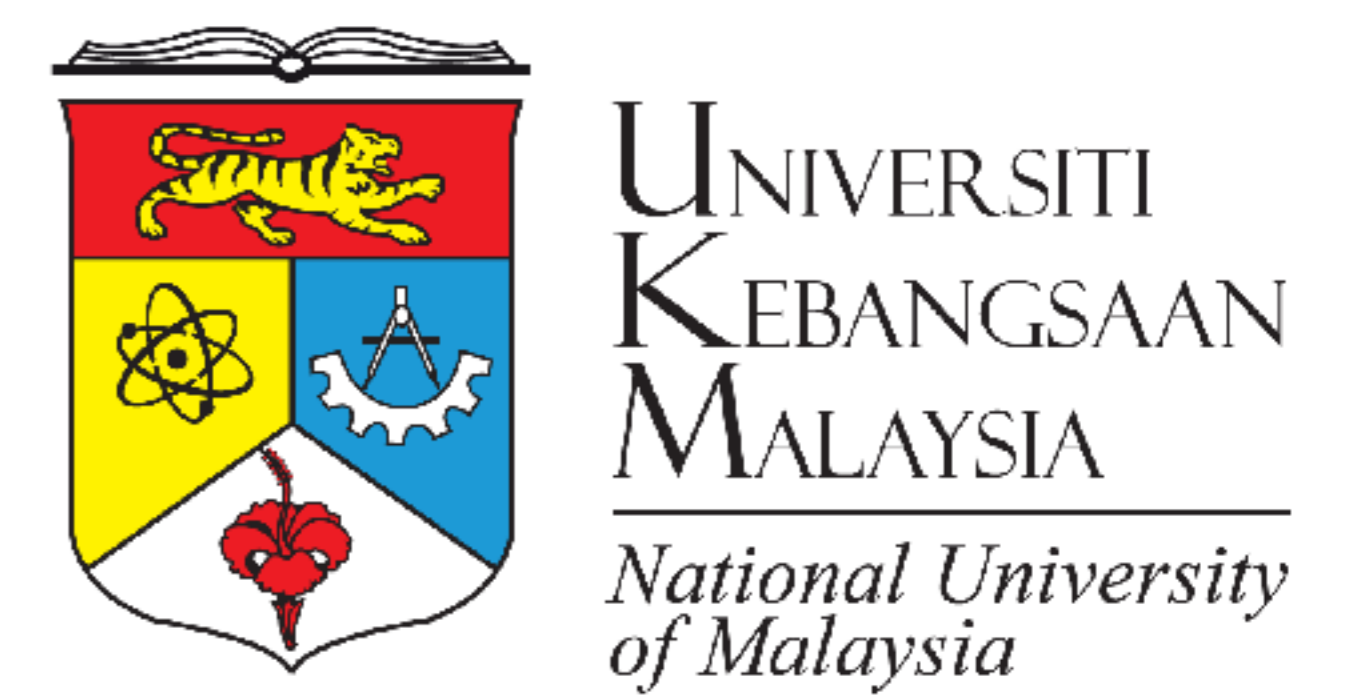


A Prospective Prevalence Study of Functional Adrenal Insufficiency and Its Outcome in Acute Myocardial Infarction in UKMMC



Norasyikin AW¹, Shazatul Reza MR¹, Suehazlyn Z¹, Norlaila M¹, Norlela S, Oteh M², Shamsul Azhar S³, Nor Azmi K¹

¹Endocrine Unit, Medical department, ²Cardiology Unit, Medical department, ³Department of Health and Statistics² Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

INTRODUCTION

Acute myocardial infarction (AMI) is a stressful condition in which it stimulates the hypothalamus-pituitary-adrenal (HPA) axis leading to mark increase in the production of cortisol. Response of the HPA axis is important factor in self defense system in adapting to illness and stress.

Adrenal insufficiency (AI) has been shown to be associated with morbidity and mortality in acute coronary syndrome patients. Functional adrenal insufficiency (FAI) is subnormal corticosteroid production during critical illness in the absence of structural defects in the HPA- axis and is usually transient. To date, none study has been performed to determine prevalence of AI among patient with AMI.

RESULTS

Forty seven (83.9%) of patients were male and 9 (16.1%) females. The mean age of patient was 55.50 ± 10.95 years old. Thirty-five (62.5%) patients had ST elevation AMI and 21 (35.5%) non-ST elevation AMI. The baseline demographic and biochemical data are shown in the table 1. The cortisol responses following LD and SD synacthen tests in study population as shown in figure 1.

Using an increment of less than 250 nmol/L following LDST and SDST, 39 (69.6%) and 2 (3.6%) patients had adrenal insufficiency respectively. Based on LDST, the diagnosis of AI was associated with significant morbidity and mortality. One patient died during the study period and had very high cortisol levels (1328 nmol/L).

Of the 15 patients who was diagnosed to have AI based on LDST during AMI, underwent repeat LDSD at day 30 of AMI, only 2 of them had responded to the test (figure 2) and the rest remained AI/ FAI. Table 2 showed cortisol responses during AMI and at 30 of post AMI among AI based on during AMI

OBJECTIVES

The aim of this study is to determine the prevalence of AI in AMI by using the low dose (LD) and standard dose (SD) synacthen tests and to correlate with morbidity and mortality.

METHOD

Fifty-six patients who fulfilled the diagnosis of AMI within 48 hours of onset were subjected to LD (1µg) synacthen test (LDST) followed by a SD (250 µg) synacthen test (SDST) two-hour later. Those who had AI, repeat synacthen test had to perform at day 30 of AMI.

Table 1. Baseline demographic and biochemical data

Variable	Number (%)
Cardiac intervention	
STEMI - Thrombolysis	26 (74.3)
- Primary PCI	6 (17.1)
- Anticoagulant	3 (8.6)
NSTEMI - Anticoagulant	21 (100)
First AMI	43 (76.8)
Recurrent AMI	13 (23.2)
Comorbidity	
DM	17 (30.4)
HPT	24 (42.9)
Dyslipidemia	18 (32.1)
IHD	13 (23.2)
Smoking	29 (51.8)
Eosinophil	0.2 ± 0.2
Potassium (mmol/l)	4.1 ± 0.4
ACTH (pg/ml)	22.84 ± 15.37
DHEA (µmol/l)	2.74 ± 2.24

Figure 1. Cortisol responses following LDST and SDST

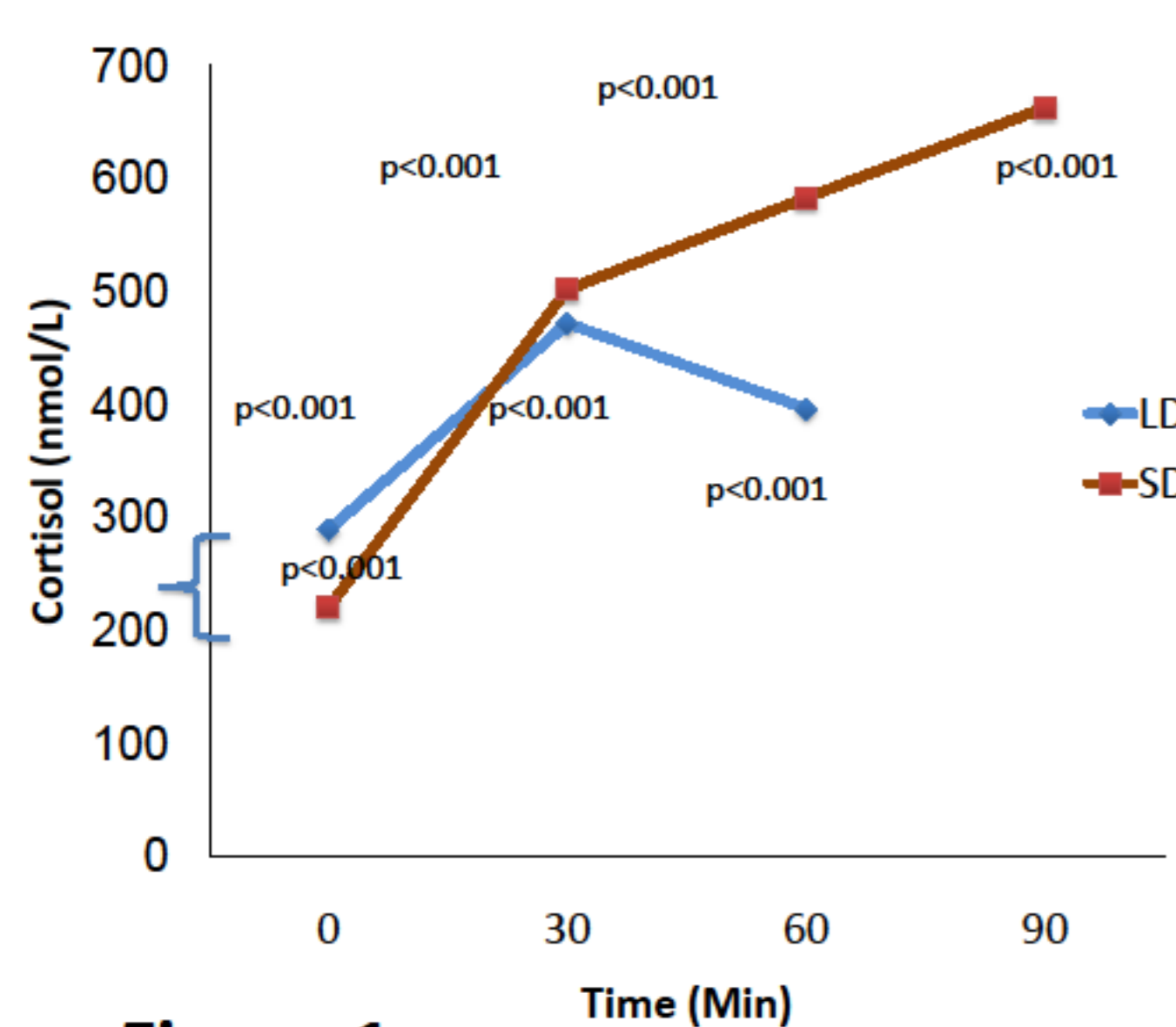


Figure 1

Figure 2. Cortisol responses following LDST among FAI + (non-responder) and FAI - (responder) at day 30 of AMI

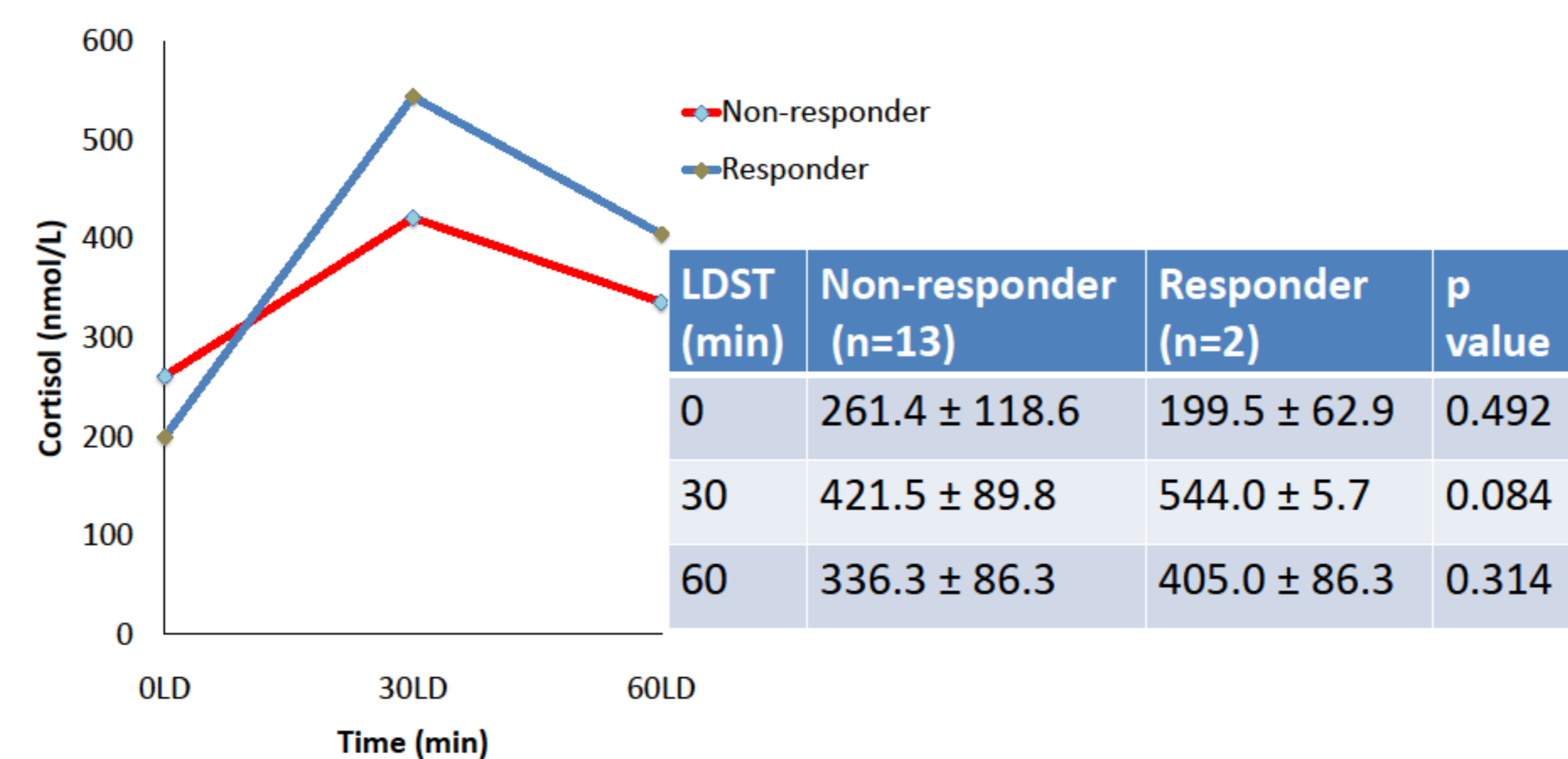


Figure 2

Table 2. Cortisol level following LDST among AMI patients with AI

LDST (min)	During AMI (nmol/L)	At day 30 of AMI (nmol/L)
0	289.5 ± 125.3	253.1 ± 113.2
30	472.0 ± 144.4	437.9 ± 95.6
60	396.6 ± 150.6	345.5 ± 86.6

DISCUSSION

The prevalence of AI among AMI patients based on cortisol increment with LDST and SDST were 69% and 3.6% respectively. This results was higher compared to previous studies most likely due to differences in study population, background of medical problems and small sample size.

Fifteen AI patient who underwent repeated LDST at 30 days of post AMI showed 13 of them remained AI or FAI. Our finding not consistent with previous study because of different study population where patient with AMI developed more complications after cardiac event than in sepsis patients. Other than that, functional adrenal insufficiency in AMI take longer than 30 days to resolve despite patients clinically asymptomatic.

CONCLUSIONS

Utilizing the LDST, adrenal insufficiency was found in 69.6% of AMI patients. Mortality of AMI showed less cortisol increment to LDST but able to reach the peak cortisol level for both tests. FAI in AMI takes longer than 30 days to recover.

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