INTRODUCTION
An accurate diagnosis of acute poisoning in the emergency department is essential for appropriate management. Studies have shown a wide variation of concordance of a history of poisoning with laboratory diagnosis, ranging from 17.4% to 72%. A history of paracetamol poisoning is moderately reliable whilst reliability of a history of illicit drug poisoning is low to moderate.1-3 Physical signs in toxic syndromes (toxicodermias) can be used to predict drugs used in acute self-poisoning. However toxidromes are more clinically relevant when only one drug is involved.14

Aim of the study
The aim of the study was to develop a model that accurately predicts a clinical diagnosis of acute poisoning.

METHODOLOGY
Study design
A retrospective case-control study was carried out using clinical and laboratory data of patients with suspected acute poisoning comparing clinical features of patients diagnosed as acute poisoning (cases) with patients having an alternative diagnosis (controls).

Setting
Mater Dei Hospital is an acute general hospital that registers more than 100,000 patients at the emergency department every year. The study was carried out on consecutive adult patients (≥14 years old) presenting to the emergency department with suspected acute poisoning in the first nine months of 2010.

Inclusion and exclusion criteria
Subjects were included if samples of blood or urine were sent for analysis to the toxicology laboratory for suspected acute poisoning. Subjects with missing hospital records or in whom a diagnosis could not be established were excluded.

Definition of cases and controls
The diagnosis was established from the hospital record or laboratory results. Cases were defined as patients for whom the primary diagnosis was acute poisoning whilst controls were defined as those patients with an alternative diagnosis. Analysis

Logistic regression analysis of significant risk factors was used to develop a predictive model whose performance was measured by plotting a receiver operator characteristic (ROC) curve and calculating the area under the curve (AUC).

RESULTS

Descriptive data
Out of 731 eligible patients, 54 were excluded because of insufficient information and 677 patients were selected and classified as 350/677 (52%) cases and 327/677 (48%) controls. There were 255 (38%) females and 422 (62%) males in the selected group with a range of ages from 14 to 94 years and a mean age of 37 years for both genders. In the cases group, there were 153/350 (43.7%) females and 197/350 (56.3%) males whilst in the control group there were 102/352 (31.2%) females and 225/352 (63.9%) males.

Univariate analysis of risk factors for diagnosis of suspected acute poisoning
Univariate analysis of the risk factors for diagnosis of acute poisoning is shown in Table 1. Age below 40 years was found to be a non-significant risk factor, whilst age below 50 years and female gender were significant risk factors with an OR=1.48 (95% CI 1.04-2.10; p=0.028) and 1.69 (95% CI 1.23-2.31; p<0.001), respectively.

A history of poisoning was associated with a high risk of positive diagnosis with an OR=87.48 (95% CI 31.92-239.72; p<0.001). Despite a high specificity (98.78%; 95% CI 96.90-99.52) sensitivity was low (52.00%; 95% CI 46.77-57.18).

A retrospective case-control study was carried out using clinical and laboratory data of patients with suspected acute poisoning comparing clinical features of patients diagnosed as acute poisoning (cases) with patients having an alternative diagnosis (controls).

Validation of prediction model using ROC analysis
Based on the significant risk factors (age—≥50 years, report of poisoning, negative history of trauma, history of alcohol ingestion and positive psychiatric drug history) a prediction model was tested using ROC curve analysis (Figure 1) which showed an AUC of 0.866 (95% CI 0.828-0.904; P<0.001) as shown in Table 5. The model was compared with a positive history of poisoning alone which showed an AUC of 0.788 (0.748-0.828; P<0.001).

Conclusions
Despite the high odds ratio for a positive history of poisoning other risk factors still retained an independent influence in the prediction model. The prediction model performed well on ROC analysis (AUC=0.868) showing that a combination of statistically significant clinical risk factors was more predictive of a diagnosis of acute poisoning than a positive history of poisoning alone.

The prediction model can form the basis of a prospectively validated clinical decision rule that identifies patients with acute poisoning. Such a model may be of value in situations when the history is unavailable or unclear such as in patients with altered mental status.

REFERENCES