UNIVERSITI PUTRA MALAYSIA

PREVALENCE OF INJURIES ASSOCIATED WITH HIGH RISE SYNDROME IN CATS PRESENTED TO THE UNIVERSITY VETERINARY HOSPITAL (UVH), UNIVERSITI PUTRA MALAYSIA

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It is hereby certified that we have read this project paper entitled "Prevalence of Injuries Associated with High Rise Syndrome in Cats Presented to the University Veterinary Hospital (UVH), Universiti Putra Malaysia", by Muhammad Dzul Ikraam Ab Rahman and in our opinion it is satisfactory in terms of scope, quality and presentation as partial fulfilment of the requirement for the course VPD 4999 – Final Year Project.

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CONTENTS

Page

LIST OF TABLES **Page**

LIST OF FIGURES **Page**

LIST OF ABBREVIATIONS

HRS	=	High Rise Syndrome
SBT	=	Sindrom Bangunan Tinggi
UVH	=	University Veterinary Hospital
HVU	=	Hospital Veterinar Universiti
UPM	=	Universiti Putra Malaysia
DSH	=	Domestic Shorthair

ABSTRAK

Abstrak dari kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999 – Projek Ilmiah Tahun Akhir.

PREVALENS KECEDERAAN BERKAITAN DENGAN SINDROM BANGUNAN TINGGI PADA KUCING YANG DIHANTAR KE HOSPITAL VETERINAR UNIVERSITI, UNIVERSITI PUTRA MALAYSIA

oleh

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2015

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Pengenalpastian jenis kecederaan Sindrom Bangunan Tinggi (SBT) yang lazim dapat menambah maklumat untuk pencegahan dan rawatan kecederaan SBT. Prevalens 21 kecederaan tersebut, tiga kecederaan paling lazim, dan perkaitan antara ketinggian kejatuhan dan tahap kecederaan dalam kajian ini telah ditentukan. Buku log dan kes perubatan kucing yang dihantar ke HVU, UPM dari 1 Januari 2002 hingga 31 Disember 2014 telah disemak. Kriteria kes yang dipilih telah didiagnosis dengan SBT, jatuh dari tingkat dua atau lebih, mempunyai penemuan imej diagnostik, dan mempunyai sekurang-kurangnya satu daripada 21 kecederaan berkaitan SBT dalam kajian ini. Prevalens 21 kecederaan yang dikaitkan dengan

SBT adalah patah tulang kaki (60%) (12/20), pneumotoraks (30%) (6/20), epistaksis dan peralihan tulang vertebra (20%) (4/2) setiap satu, luka, kencing berdarah, dan peralihan sendi kaki (15%) (3/20) setiap satu, dan laserasi, kontusi peparu, dan patah gigi, lelangit, pinggul, dan tulang vertebra (5%) (1/20) setiap satu. Tiga kecederaan paling lazim yang dikaitkan dengan SBT adalah kepatahan tulang kaki, pneumotoraks, dan epistaksis; kecederaan yang keempat, peralihan tulang vertebra, mempunyai prevalens yang sama dengan epistaksis. Ketinggian kejatuhan dari tingkat tiga hingga tingkat enam adalah berkait secara positif dan moderat dengan tahap kecederaan kucing yang ditimpa SBT ($r = 0.622$; $p = 0.031$; $n = 12$).

Kata kunci: Sindrom Bangunan Tinggi, ketinggian kejatuhan, kecederaan, korelasi, prevalens

ABSTRACT

An abstract of the project paper to the Faculty of Veterinary Medicine in partial fulfilment of the course VPD 4999 – Final Year Project.

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by

Muhammad Dzul Ikraam Ab Rahman

2015

Supervisor: Prof Madya Dr Arifah Abdul Kadir

Co-Supervisor: Dr Siti Zubaidah Ramanoon

The identification of common High Rise Syndrome (HRS) injuries in cats may help to fill the information gap required to prevent and treat the injuries. The prevalence of the 21 injuries, three most common injuries, and the correlation between height of fall and severity of injuries were determined in this study. Logbooks and medical cases of cats presented to the UVH, UPM from 1 January 2002 until 31 December 2014 were reviewed. The criteria used for selected cases were cats diagnosed with HRS, fell from at least the 2nd storey, had diagnostic imaging findings, and must have at least one out of the 21 injuries associated with HRS in this study. The prevalence of injuries associated with HRS in this study were

limb fractures (60%) (12/20), pneumothorax (30%) (6/20), epistaxis and vertebral luxation (20%) (4/20) each, wound, haematuria, and limb luxation (15%) (3/20) each, and laceration, pulmonary contusion, dental fractures, hard palate fractures, pelvic fractures, and vertebral fractures (5%) (1/20) each. Three most common injuries associated with HRS were limb fractures, pneumothorax, and epistaxis; the fourth injury, vertebral luxation, shared the same prevalence with epistaxis. The height of fall at 3rd to 6th storeys was positively and moderately correlated with the severity of injuries of cats with HRS ($r=0.622$; $p=0.031$; $n=12$).

Keywords: High Rise Syndrome, height of fall, injury, correlation, prevalence

1.0 INTRODUCTION

High rise syndrome (HRS) is a term that refers to traumatic injuries sustained by cats following a fall from a height of at least two storeys; it is associated HRS with the injuries triad of epistaxis, cleft palate, and pneumothorax (Robinson, 1976). In Malaysia, the height of living rooms and bedrooms in residential buildings must not be less than 2.5 metres, kitchens must not be less than 2.25 metres, and bathrooms, water-closets, latrines, porches, balconies, verandahs, garages, and the like must not be less than 2 metres (Uniform Building By-Laws 1984). As such, the minimal height of a residential building storey in Malaysia is 2.5 metres.

However, later studies reported that limb fractures are other injuries commonly associated with HRS (Papazoglou *et al*,. 2001; Vnuk *et al.*, 2004). It was suggested that it is recognised together with the injuries triad as an injuries tetralogy of HRS (Vnuk *et al.*, 2004).

There are three types of relationship between the height of fall and severity of injuries associated with HRS, which are linear relationship (Dupre *et al.*, 1995), curvilinear relationship (Flagstad *et al.*, 1998; Papazoglou *et al.* 2001), and non-definite pattern (Vnuk *et al.*, 2004).

There are limited information on the prevalence of injuries in cats with HRS presented to UVH, UPM. Hence, this study was undertaken to fill the gap of information which is required for prevention and treatment of the traumatic injuries. The prevalence of different types of injury would enable the identification of common injuries associated with the syndrome. The identification of common

injuries would aid clinicians to develop a concise differential diagnoses for traumatic injuries and to anticipate possible injuries related to HRS in order to achieve effective medical management. This information would also help raise awareness among cat owners living in high rises concerning the syndrome, in which precautionary measures are taken to prevent the cats from falling down.

The objectives of the study were:

(i) to determine the prevalence of 21 injuries associated with HRS in cats presented to the UVH, which are contusions, abrasions, wounds, lacerations, pulmonary contusions, haematuria, epistaxis, dental fractures, limb fractures, limb luxation, hard palate fractures, mandibular fractures, pelvic fractures, temporomandibular joint luxations, haemothorax, pneumothorax, abdominal wall rupture, diaphragmatic rupture, rupture of urinary bladder, vertebral fractures, and vertebral luxation,

(ii) to identify the three most common types of injuries among the types of injuries stated in the first objective, and

(iii) to determine the correlation between height of fall and severity of injuries associated with HRS in cats admitted to the UVH, UPM.

Based on the objectives above, the hypotheses of this study were:

(i) the prevalence of injuries is the same for all 21 injuries,

(ii) the highest three prevalence are the three most common injuries among the 21 injuries, and

(iii) there is no correlation between height of fall and severity of injuries.

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