Association of Travel Distance and Severity of Odontogenic Infections

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Introduction

Odontogenic infections (OI) arise from untreated dental disease in the community. Patients presenting to a tertiary hospital with an OI can be critically ill, require ICU support, multiple returns to theatre and a protracted length of stay.

Objectives

The primary aim of this study was to determine if patients who lived a greater distance from Geelong University Hospital presented with more severe OI's. A secondary aim was to evaluate the treatment patients had for the same infection prior to hospitalisation.

Method

This was a retrospective review of all patients presenting to the Geelong University Hospital ED or admitted directly to the OMS unit from the 1st of January 2018 until July 2021 with an OI. The main outcome variable considered in this study was the severity of infection. The main clinical markers for severity of infection collected in this study were, trismus, airway compromise, ICU admission, CRP and number of spaces involved in the infection (single vs multi-space infection).

A bi-variate analysis of the markers of severity was conducted. The dichotomous groups were analysed by comparing the means with an independent t-test (p=.05). A multivariate regression analysis was undertaken to determine the association of travel distance on the clinical signs of severity. The statistical analysis was undertaken on IBM SPSS Statistics Version 28.0.1.1

Results

227 patients were included in this study (table 1). There were 144 OMFS, 83 ED, and 8 ICU admissions. 60% of the OI's presenting to GUH required emergency access to theatre. 109 (48%) were male, 118 (52%) female. 127 (55.9%) smokers, 100 (44.1%) non-smokers. 188 (82.8%) presenting directly to GUH, 39 (17.2%) patients were from Inter-Hospital transfers. The majority of patients were admitted under OMFS (63.4%), and 36.6% were managed in the Emergency Department.

Of the patients presenting to GUH 70.3% had prior treatment before hospitalisation, and antibiotics without source control was the most frequent treatment (83.1%).

The mean travel distance for patients with more severe markers of infection significantly greater than patients with minor infections (p=<.001). Patients who required an inter-hospital transfer accounted for most cases with airway compromise requiring ICU admission (62.5%).

Table 1. Analysis of hospital admissions for OI's

		N (%)	Mean travel (km)	P value
Admission	OMS	144 (63.4%)	36.3	.005
	ED	83 (36.5%)	18.6	
Emergency Theatre	Yes	133	36.6	.007
	No	94	20.2	
ICU admission	Yes	8	81.8	<.001
	No	219	27.9	
Multi-space infection	Yes	19	92.2	<.001
	No	207	24.2	
Trismus	Yes	30	59.9	<.001
	No	197	25.2	
Airway Compromise	Yes	13	85.2	<.001
	No	214	26.5	
Length of Stay	≤ 1 day	157	21.2	<.001
	>1 day	70	49.2	

Discussion

The major finding of this study was that the greater the distance a patient lived from GUH, the more severe their infection. This may be the result of a lack of access to primary dental services in areas outside of metropolitan Geelong.

We identified that 70% of patients who presented to ED had previously sought treatment in the community prior to hospital, with 43% of hospitalised patients having seen a medical doctor in the community. In 95% of these cases patients were prescribed antibiotics without appropriate source control.

Resistant bacterial species have previously been identified in 18% of OI's. The overprescribing of antibiotics is becoming a public health concern.

Conclusion

Travel distance is associated with more severe OI's. This is likely due to lack of access to primary preventative services in rural and regional communities in the GUH catchment area. Future projects should look at addressing lack of access to primary preventative dental services and antimicrobial stewardship in regional Victoria.

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