



THE ROLE OF ASCORBIC ACID
IN THE PERIODONTIUM

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Table of contents

	Page
Declaration	iv
Acknowledgements	v
List of Tables	vi
Index of Figures	vii
Summary	viii
Chapter 1	
Introduction	1
Chapter 2	
Review of the Literature	4
2.1 Epidemiological Studies	4
2.2 Vitamin C and collagen formation	
2.2.1 Histopathological Studies	6
2.2.2 Biochemical Studies	10
2.3 Vitamin C and mucosal permeability	12
2.4 Vitamin C and host response	
2.4.1 Immunity	14
2.4.2 Neutrophil function	15
2.5 Vitamin C and host environment	
2.5.1 Smoking	19
2.5.2 Alcohol	20
2.5.3 Oral contraceptives	20
2.6 Vitamin C and histamine metabolism	21
2.7 Vitamin C and drug metabolism	22

	Page
Chapter 2 (cont.)	
2.8 Vitamin C deficiency models	22
2.8.1 Vitamin C metabolism in the guinea pig	23
2.8.2 Model for chronic marginal vitamin C deficiency	24
 Chapter 3	
Materials and Methods	
3.1 Animal experiment	25
Protocol	26
Vitamin C assay	28
Histological preparation	34
3.2 Clinical experiment	36
3.3 Statistical Analysis	36
 Chapter 4	
Results	
4.1 Animal experiments	37
Physical indices	
Vitamin C assay	43
Histopathological findings	50
4.2 Human data	61
 Chapter 5	
Discussion	66
References	79

Declaration

This report is submitted in partial fulfillment of The M.D.S. Degree of The University of Adelaide. This report contains no material that has been accepted for the award of any other degree or diploma in any University. To the best of my knowledge, this report contains no material previously published, except where due reference has been made in the text.

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List of Tables

Table No.		Page
1	Guinea pig weight -vitamin C deficiency	39
2	Guinea pig temperature	41
3	Plasma ascorbate concentration	43
4	Lymphocyte ascorbate concentration -lymphocyte count at week 17	44
5	Gingival ascorbate concentration	45
6	Correlation of ascorbate content in gingivae and plasma	46
7	Correlation of ascorbate content in gingivae and lymphocytes	47
8	Inflammatory scores in gingivae	50
9	Plasma ascorbate concentrations	61
10	Gingival ascorbate concentrations	62
11	Relationship between gingival and plasma ascorbate concentration	64
12	Correlation of plasma ascorbic acid	75

Index of Figures

Figure No.		Page
1	Incisal ligature in place	26
2	Blood collection—abdominal aorta	28
3	Lymphocyte separation	29
4	Standard curve	32
5	Inflammatory index	35
6	Guinea pig body weight	38
7	Guinea pig body temperature	40
8	Ascorbate concs. of gingivae and plasma	48
9	Ascorbate concs. of gingivae and lymphocytes	49
10	Histopathology of gingivae - control group	52
11	Histopathology of gingivae - test group	53
12	Gingival fibres - control and test groups	55
13	Periodontal fibres - control group	56
14	Periodontal fibres - test group	57
15	Alveolar bone - control group	59
16	Alveolar bone - test group	60
17	Relationship in humans between plasma and gingival ascorbate concentrations	65

Summary

Periodontal disease is a chronic condition that over a long period of time has the potential to destroy sufficient of the supporting bone to loosen and eventually become non-functional. There is a wide range of responses between individuals to the parasite bacteria that trigger the host defence system and which is itself responsible for the local damage. There has been an increasing awareness that host response is important in the quality of the disease experienced. This research has been directed toward the clarification of the role of one of these factors (vitamin C). This factor appears to have a role in the formation of collagen, a vital gingival structure and it plays a key role in host defence as a consequence of its requirement by neutrophils for effective chemotaxis and phagocytosis.

This report examines the possible role of vitamin C in the aetiology of periodontal disease. The investigation revealed a poor correlation between ascorbate levels of human gingivae and plasma but there was a good correlation in the animal model.

Gingival ascorbate concentration was found to be ten-fold higher than the plasma ascorbate level, suggesting that a high concentration of the vitamin occurs in the gingivae. Chronic marginal vitamin C deficiency may play a significant part in periodontal disease by affecting the host defense mechanism and the collagen structural components, including the microvascular system. The value of vitamin C in the treatment of periodontal disease may be found to improve host response mechanism via neutrophil function, promotion of repair and healing via collagen synthesis, and improved microvascular integrity in conditions where the gingival microcirculation has been impaired by environmental factors.