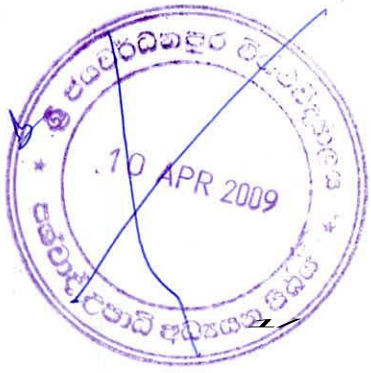
DOI: 10.31357/fmesphd.2010.00126

ERECTILE DYSFUNCTION AND ITS ASSOCIATIONS AMONG MEN WITH DIABETES

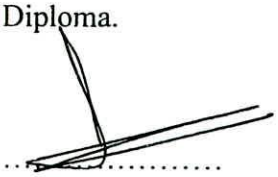


BY

LASANTHA SANJEEWA MALAVIGE

Thesis submitted to University of Sri Jayawardenapura for the award of the Degree of Doctor of Philosophy in Medicine on ERECTILE DYSFUNCTION AND ITS ASSOCIATIONS AMONG MEN WITH DIABETES.

I certify that the work presented in this thesis was carried out by me under the supervision of Professor S D Jayaratne, Professor S Sivayogan, Professor S Kathriarachchi and Dr J C Levy and a report of this work has not been submitted in whole or part to any other University or any other institution for another Degree or Diploma.



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We certify that above statement made by the candidate is true and thesis is suitable for submission to the University of Sri Jayawrdeanpura for the purpose of evaluation.

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LIST OF ABBREVIATIONS

5-HT	5-Hydoxytriptamine
ACEIs	Angeotensin converting enzyme inhibitors
ACH	Acetylecholine
AGEs	Advanced Glycation end products
ALP	Alkaline Phosphatase
ALT	Alenine Amino Transferese
ANOVA	Analysis of Varience
ARBs	Angiotensin Converting Enzyme Inhibitors
BMI	Body Mass Index
BP	Blood Pressure
cAMP	Cyclic Adenosine Mono Phosphate
cGMP	Cyclic Guanosine monophosphate
CSTH	Colombo South Teaching Hospital
DPS	Diabetes Prevention Study
ED	Erectile Dysfunction
EHS	Erection Hardness Score
FBS	Fasting Blood Sugar
GFR	Glomerular Filtration Rate
GP	General Practitioner
HbA1c	Glycosylated Haemoglobin A1c
HDL	High Density Lipoproteins
IDPP	Indian Diabetes Prevention Program

IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
IIEF5	5 Item International Index of Erectile Function
IMD	Index of Multiple Deprivation
LDL	Low Density Lipoproteins
MUSE	Medicated Urethral System for Erection
NHS	National Health Service of the UK
NK	Not Known
NO	Nitric Oxcide
NOS	Nitric Oxide Synthese
OGTT	Oral Glucose Tolerance Test
PCT	Primary Care Trust
PDE5 inhibitors	Posphodiesterase 5 inhibitors
PE	Premature Ejaculation
PEDT	Premature Ejaculation Diagnosis Tool
PGE-1	Prostaglandin E-1
PKG-1	cGMP dependent kinase-1
QoL	Quality of Life
RL	Reduced Libido
ROS	Reactive Oxygen Species
SD	Standard Deviation
SES	Sexual Excitation Score
SF-36	Short Form-36
SHBG	Sex Hormone Binding Globulin
SHIM	Sexual Health Inventory for Men

SIS	Sexual Inhibition Score
TG	Triglycerides
TIA	Transient Ischaemic Attack
TSH	Thyroid Stimulating Hormone
UK	United Kingdom
USA	United States of America
VIP	Vasoactive Intestinal Polypeptide
WHO	World Health Organisation

ACKNOWLEDGEMENTS

The work presented in this thesis would not have been possible without the support of many individuals to whom I am extremely grateful. First of all, I thank with greatest respect my supervisors Prof S D Jayaratne, Department of Medicine, Prof S Kathriarachchi, Department of Psychiatry and Prof S Sivayogan, Department of Community Medicine, Faculty of Medical Sciences, University of Sri Jayawardenapura and Dr J C Levy, Oxford Centre for Diabetes, Endocrinology and Metabolism, University of Oxford for their inspiration, wisdom, extremely valuable support and guidance throughout.

I thank Dr J C Levy sincerely for the great opportunity given to me to work in Oxford Centre for Diabetes, Endocrinology and Metabolism, University of Oxford. I am also grateful to him for his invaluable academic supervision in this work and his kindness and generosity during my four years of stay in Oxford.

Prof David Matthews, the professor of Diabetic Medicine, University of Oxford and the chairman of Oxford Centre for Diabetes, Endocrinology and Metabolism is acknowledged and thanked for all his help, guidance and encouragement.

The valuable contribution of Prof John Bancroft, the former director of Kinsey Institute who is widely regarded as the world leader in Sexual Medicine is acknowledged for all his advice and guidance.

Prof Irene Stratton is acknowledged for her valuable advice on statistical methods.

Dr Anne Clarke is acknowledged for her encouragement and guidance. I also thank my friends, colleagues, clinicians and administrators at the Oxford University specially Dr Nathan Hill, Dr Prasad Katulanda, Dr Nikki Meston, Dr Nikki Karawitake, Ms Carol Hill, Mr Edward Gibbs and Miss Louise Williams for their friendship and support.

I thank my collaborators from eight primary care trusts and the doctors of 25 GP practices who helped with the study. All those who took part in Sri Lankan and the UK studies are thanked sincerely for their generosity.

Pfizer Global and the Oxford University are acknowledged for funding the research work carried out in the UK. Bayer Schering Phamra is thanked for financing the printing costs of the patient information booklet which was distributed among the participants of the study.

I also would like to thank Dr Upeksha Ratnayake, Dr Pabasi Wijesekara and Dr Dhanesha Seneviratene- Epa for their extremely useful contribution in different stages of data collection and patient recruitment.

I thank my parents with the greatest respect for all what they have done for me and their unconditional love, encouragement and for being the most amazing parents. I thank sincerely my sister who always stood behind me for looking after my other concerns during this work.

At last but not the least, I would like to thank my wife Neelika, daughter Sauni and little son Thenuka for their love, comfort, understanding and patience specially during long stays away from the family. I thank my in-laws for their support and looking after Sauni and Thenuka during my absence from the country, giving me some freedom in mind to concentrate on this work.

ABSTRACT

Introduction Diabetes is reaching pandemic levels and South Asians are at increased risk of developing diabetes and diabetic complications. Erectile Dysfunction (ED) defined as inability to achieve or maintain an erection for satisfactory sexual intercourse is a common complication of diabetes. Despite higher predisposition to diabetes, this complication has never been studied (no published data available) among South Asian men with diabetes. The work presented in this thesis were carried out in two components and presented as the Sri Lankan study and the Oxford Sexual Dysfunction Study.

Objectives of the Sri Lankan Study

General Objective

To determine the proportion of ED among a sample of Sri Lankan diabetic men and to describe its associations.

Specific Objectives

1. To determine the proportion of Erectile Dysfunction in diabetic patients attending clinic in Colombo South Teaching Hospital.
2. To describe the association of Erectile Dysfunction with Premature Ejaculation and Reduced Libido.
3. To describe clinical, socio economic and life style associations of Erectile Dysfunction.
4. To describe psychological impact and quality of life using validated scales.

Objectives of the Oxford Sexual Dysfunction Study

Stage1

To linguistically validate set of questionnaire in to Hindi, Urdu, Panjabi, Tamil and Sinhalese.

Stage 2

1. To assess the feasibility of using validated postal questionnaires and GP records to assess sexual dysfunction in a primary care setting in diabetic and non diabetic men of South Asian and Europid ethnic extraction and determine factors affecting recruitment and study completion.
2. To estimate the prevalence of Erectile Dysfunction, premature ejaculation and reduced libido in South Asian individuals with diabetes compared Europid men with diabetes and their age matched non diabetic controls.
3. To determine the associations between Erectile Dysfunction, Premature Ejaculation and Reduced Libido.
4. To determine clinical, biochemical, socio economic and life style associations of Erectile Dysfunction in both diabetic and non diabetic men.

Methods Sri Lankan Study- A cross sectional descriptive study carried out in Colombo South Teaching hospital diabetic clinic using validated scales, structured interviewer administered questionnaire, physical examination, clinical records and laboratory investigations.

Oxford Study- The ligustic validation was carried out by adopting internationally accepted methodology which included poilot testing with five volunteers for each language version.. The stage 2 was a GP practice based cross sectional descriptive study using clinical data available in the GP records and the set of postal questionnaire. This study was carried out in 25 GP practices from 8 primary care trusts using clinical data held by the GP records and a set of postal questionnaire.

Results- I found very high proportion (73%) diabetic men to have some degree of erectile dysfunction. I also found erectile dysfunction to be strongly associated with

premature ejaculation (p=0.0001) and reduced libido (p=0.0001) together with several important clinical and socio economic and life style associations. Erectile dysfunction was found to be associated with poor quality of life assessed by both generic and disease specific quality of life measures.

A set of useful scales in sexual medicine were ligusticaly validated into Hindi, Urdu, Panjabi, Tamil and Sinhalese. The overall recruitment rate was low and was influenced by ethnicity, diabetes status, age and area based deprivation index. I found high prevalence of erectile dysfunction in diabetic men compared to non diabetic men ($p<0.001$). No ethnic difference in erectile dysfunction prevalence was found in diabetic men. However, South Asian non diabetic men had significantly higher prevalence of erectile dysfunction compared to their non diabetic Europid counterparts (p=0.04). The strong association we found in the Sri Lanka study between erectile dysfunction and premature ejaculation was found in larger group of participants irrespective of their diabetes status and ethnicity. Other interesting and novel funding was the significantly higher proportion of men of South Asian origin having premature ejaculation in both diabetic (p=0.001) and non diabetic groups (p=0.001). The high prevalence of premature ejaculation in South Asians needs to be investigated further in order to indentify aetiology for this.

Conclusions- Erectile dysfunction in diabetes a common and serous quality of life issue. Clinician managing diabetic patients should take a holistic approach in managing diabetes related erectile dysfunction as it is associated with premature ejaculation, reduced libido, poor glycaemic control, hypertension and many other clinical socio economic and life style factors.