HOW TO IMPLEMENT QUALITY USE OF MEDICINES IN DEVELOPING COUNTRIES—AN

EXAMPLE FROM CHINA

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A THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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STATEMENT OF ORIGINALITY

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I hereby certify that this thesis is submitted in the form of a series of published papers of which I am a joint author. I have included as part of the thesis a written statement from each coauthor; and endorsed by the Faculty Assistant Dean (Research Training), attesting to my contribution to the joint publications.

Lan Gao

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

QUM	-	Quality use of Medicine
EBM	-	Evidence-based Medicine
СМА	-	Cost Minimisation Analysis
CEA	-	Cost Effectiveness Analysis
CUA	-	Cost Utility Analysis
CBA	-	Cost Benefit Analysis
HRQoL	-	Health-related Quality of Life
AEDs	-	Antiepileptic Drugs
RTG	-	Retigabine
LAC	-	Lacosamide
ESL	-	Eslicarbazepine
CAR	-	Carisbamate
BRI	-	Brivaracetam
PER	-	Perampanel
LEV	-	Levetiracetam
LTG	-	Lamotrigine
OXB	-	Oxcarbazepine
ТРМ	-	Topiramate
CBZ	-	Carbamazepine
WTP	-	Willingness to Pay
QALY	-	Quality-adjusted Life Year
ICER	-	Incremental Cost Effectiveness Ratio
GDP/Capita	-	Gross Domestic Production/Capita
CNY	-	Chinese Yuan
RCT	-	Randomised Controlled Trial
T ₂ DM	-	Type 2 Diabetes Mellitus
QWB-SA	-	Quality of Well-being Scale, Self-Administered

EQ-5D	-	EuroQol
MMSE	-	Mini Mental State Examination
ТТО	-	Time-Trade-Off
SG	-	Standard Gamble
VAS	-	Visual Analogue Scale
CV	-	Contingent Valuation
COI	-	Cost of Illness
MLR	-	Multiple Linear Regression
SD	-	Standard Deviation
IGR	-	Interquartile Range
ANOVA	-	Analysis of Variance
ICC	-	Intra-class Correlation Coefficient

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Abstract

In this thesis, we aimed to evaluate the feasibility to apply the concept of quality use of medicine in developing country at the micro level using China as an example.

When evaluating the technical feasibility of applying quality use of medicine (QUM) principles in a developing country, firstly, we attempted to identify and summarise the clinical evidence on the efficacy and safety of different drugs, to provide the scientific data for formulation of clinical recommendation. Then considering the limitations of the decision making in chronic diseases based on efficacy and safety, we translated and validated a health utility measure (Quality of Well-Being Scale Self-Administered, QWB-SA) in Chinese epileptic patients. Furthermore, to prove the value for money, cost-effectiveness analysis (CEA) studies were performed to ascertain the clinical and economic consequences. Fourthly, for purpose of providing a more transparent CEA threshold to interpret Incremental Cost-effectiveness Ratio (ICER) from CEA studies, an empirical study was carried out to quantify the Willingness-to-Pay per Quality-adjusted Life Year (WTP/QALY) value in epileptic and general populations. Lastly, with the intention to aid the healthcare planning, disease prioritising, and benefit assessment, we undertook a holistic burden of disease study by gauging the economic burden of epilepsy in China.

In these studies, we made several useful findings. First, via the meta-analysis, we found that newer generation of antiepileptic drugs (AEDs) as the adjunctive treatment were more effective than placebo while with higher incidence of adverse effects. Second, we also found out that as a preference-based utility measure, QWB-SA outperformed EuroQol (EQ-5D) in terms of better sensitivity and fewer ceiling effects. Third, even with increased life expectance, QALYs, lower incidences in diabetes-related complications comparing with glimepiride, using the WTP/QALY threshold of CNY 100,000, administration of liraglutide was not cost-effectiveness in China. Fourth, we found that it is feasible to construct the CEA threshold by valuing the utility and WTP simultaneously, and the 1 to 3 times GDP/Capita could potentially serve as the CEA threshold

Abstract

reference in the Asian region. Fifth, we found that epilepsy is a cost-intensive disease in China from a societal perspective.

In conclusions, this thesis has illustrated how to realise the quality use of medicine at the micro-level in a developing country. Our findings are useful in informing the clinicians and decision-makers to better understanding the importance of quality drug uses and strategies to realise it, particularly for developing countries.