

**UNIVERSITI SAINS MALAYSIA
GERAN PENYELIDIKAN UNIVERSITI
PENYELIDIKAN
LAPORAN AKHIR**

**EARLY DETECTION OF HEARING LOSS IN
TUBERCULOSIS PATIENT USING STREPTOMYCIN BY
HIGH FREQUENCY DISTORTION PRODUCT
OTOACOUSTIC EMISSIONS (DPOAE) AND PURE TONE
AUDIOMETRY**

PENYELIDIK

DR. HAZAMA MOHAMAD

PENYELIDIK BERSAMA

**DR. KHAIRI MD DAUD
DR. NORMASTURA ABD RAHMAN
DR. ZULKIFLEE SALAHUDDIN**

2012

1. Nama Ketua Penyelidik: **Dr Hazama Binti Mohamad**
Name of Research Leader

Profesor Madya/
Assoc. Prof.

Dr./
Dr.

Encik/Puan/Cik
Mr/Mrs/Ms

2. Pusat Tanggungjawab (PTJ):
School/Department

Pusat Pengajian Sains Perubatan

3. Nama Penyelidik Bersama:
Name of Co-Researcher

Dr Khairi Md Daud
Dr Normastura Abd Rahman
Dr Zulkiflee Salahuddin

4. Tajuk Projek:
Title of Project

Early detection of hearing loss in tuberculosis patient using Streptomycin by High Frequency

Distortion Product Otoacoustic Emission (DPOAE) and Pure tone Audiometry (PTA)

5. Ringkasan Penilaian/Summary of Assessment:

	Tidak Mencukupi Inadequate		Boleh Diterima Acceptable	Sangat Baik Very Good	
	1	2		3	4
i) Pencapaian objektif projek: Achievement of project objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Kualiti output: Quality of outputs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Kualiti impak: Quality of impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Pemindahan teknologi/potensi pengkomersialan: Technology transfer/commercialization potential	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v) Kualiti dan usahasama : Quality and intensity of collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
vi) Penilaian kepentingan secara keseluruhan: Overall assessment of benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

6. **Abstrak Penyelidikan**

(Perlu disediakan di antara 100 - 200 perkataan di dalam Bahasa Malaysia dan juga Bahasa Inggeris. Abstrak ini akan dimuatkan dalam Laporan Tahunan Bahagian Penyelidikan & Inovasi sebagai satu cara untuk menyampaikan dapatan projek tuan/puan kepada pihak Universiti & masyarakat luar).

Abstract of Research

(An abstract of between 100 and 200 words must be prepared in Bahasa Malaysia and in English).
This abstract will be included in the Annual Report of the Research and Innovation Section at a later date as a means of presenting the project findings of the researcher/s to the University and the community at large)

attached

7. **Sila sediakan laporan teknikal lengkap yang menerangkan keseluruhan projek ini.**

[Sila gunakan kertas berasingan]

Applicant are required to prepare a Comprehensive Technical Report explaining the project.
(This report must be appended separately)

attached

Senaraikan kata kunci yang mencerminkan penyelidikan anda:

List the key words that reflects your research:

Bahasa Malaysia

Bahasa Inggeris

Saringan

Screening

Toksik pendengaran

Ototoxicity

Ujian pendengaran

Hearing test

8. **Output dan Faedah Projek**

Output and Benefits of Project

(a)* **Penerbitan Jurnal**

Publication of Journals

(Sila nyatakan jenis, tajuk, pengarang/editor, tahun terbitan dan di mana telah diterbit/diserahkan)
(State type, title, author/editor, publication year and where it has been published/submitted)

Type: Original Article has been submitted

Title: Screening of ototoxicity in patients using streptomycin by distortion product otoacoustic

Emissions

Authors: Mohd Khairi Md Daud, Hazama Mohamad, Ali Haron, Normastura Abd Rahman

Journal: Otology & Neurootology

(b) **Presentasi:** 15th National conference on Medical & Health Sciences, July 2010. "Ototoxic effect of Streptomycin in tuberculosis patients".

- (c) **Faedah-faedah lain seperti perkembangan produk, pengkomersialan produk/pendaftaran paten atau impak kepadadasar dan masyarakat.**
State other benefits such as product development, product commercialisation/patent registration or impact on source and society.

The benefit of the study is on the management of patient with Tuberculosis on antituberculosis treatment.

There is a tremendous improvement in management of patient on antituberculosis treatment and this will affect the quality of life of the patients.

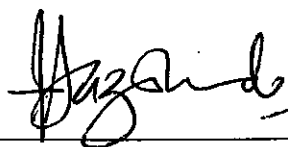
* Sila berikan salinan/ *Kindly provide copies*

- (d) **Latihan Sumber Manusia**
Training in Human Resources

- i) **Pelajar Sarjana:**
Graduates Students
(Perincikan nama, ijazah dan status)
(Provide names, degrees and status)

Dr Ali Haron.
Ijazah Sarjana Keperawatan Otorinolaryngologi dan Kepala Leher (MMED ORL- HNS)

- ii) **Lain-lain:**



Tandatangan Penyelidik
Signature of Researcher

22.2.12

Tarikh
Date

Komen Jawatankuasa Penyelidikan Pusat Pengajian/Pusat
Comments by the Research Committees of Schools/Centres

This project has been completed successfully and all objectives achieved. The output of this project include a dissertation of M.Phil (OPL-HNS) and a manuscript submitted to *Otology & Neurology*.

This report has been assessed by an independent assessor and approved by the PTJ panel committees

PROFESSOR AHMAD SUKARI HALIM
Chairman of Research Committee
School of Medical Sciences
HSEW Campus
Universiti Sains Malaysia
16150 Kubang Kerang, Kelantan.

TANDATANGAN PENERUS
JAWATANKUASA PENYELIDIKAN
PUSAT PENGAJIAN/PUSAT
Signature of Chairman
[Research Committee of School/Centre]

17/10/12
Tarikh
Date

ABSTRAK

Streptomycin digunakan dalam kombinasi rawatan utama penyakit tuberculosis. Ia telah diketahui menyebabkan kurang pendengaran telinga, kerosakan buah pinggang dan kerosakan saraf. Pure tone Audiometry (PTA) adalah alatan yang digunakan untuk mengesan tahap pendengaran. Distortion product otoacoustic emission (DPOAE) dikatakan lebih sensitif berbanding PTA. Kajian ini membandingkan dua alatan tersebut untuk mengesan kesan sampingan kurang pendengaran pada pesakit batuk kering yang dirawat dengan streptomycin. Seramai 96 pesakit baru batuk kering yang dirawat dengan streptomycin telah disaring. Lima puluh pesakit telah bersetuju dan dipilih dalam kajian. Pesakit akan menjalani ujian alatan "DPOAE" (8,9,10 kHz) dan "PTA" (0.25-8 kHz) sebelum rawatan, minggu pertama, minggu kedua, minggu keempat dan minggu kelapan rawatan. Insiden kesan sampingan kurang pendengaran didalam kajian ini adalah 29.2 %. Alatan DPOAE mengesan kesan sampingan kurang pendengaran didalam 77.1 % (37 pesakit) dan alatan PTA sebanyak 29.2 % (14 pesakit). Terdapat kaitan antara kesan sampingan kurang pendengaran dengan jantina ($P=0.011$) dan umur ($P=0.003$). Tidak terdapat kaitan antara kesan sampingan kurang pendengaran dengan pengambilan ubatan lain sebelum rawatan ($P=0.621$), penyakit lain ($P=0.140$) dan nilai urea ($P=1.0$).

DPOAE adalah alatan yang amat berkesan dan sensitif untuk pengesanan awal kesan sampingan kurang pendengaran dalam pesakit batuk kering yang dirawat dengan streptomycin.

ABSTRACT

Combination of Streptomycin, Isoniazid, Rifampicin and Pyrazinamide (SHRZ) are treatment of choice for tuberculosis. Streptomycin is known to cause ototoxicity, nephrotoxicity and neurotoxicity. Distortion product otoacoustic emission (DPOAE) is thought to be more sensitive for early detection of ototoxicity compare to pure tone audiometry (PTA). The aim of this study was to compare these two methods in newly diagnosed tuberculosis patients on streptomycin for early detection of ototoxicity.

Ninety six newly diagnosed tuberculosis patients on streptomycin were screened and 50 patients finally included in this study. High frequency DPOAE and PTA were performed at several intervals. The incidence of ototoxicity in this study after completion two months of IM Streptomycin (15 mg/kg daily) is 29.2 % (14 patients) using PTA (0.25 - 8kHz). While using high frequency DPOAE detected ototoxicity in 77.1 % (37 patients). There was an association between ototoxicity with sex ($P=0.011$) and age ($P=0.003$). There was no association between ototoxicity with other medications taken ($P=0.621$), pre treatment illness ($P=0.140$) and urea level ($P=1.0$).

High Frequency (DPOAE) is a good monitoring tool for early detection of ototoxicity in tuberculosis patient on streptomycin compare to PTA.