IERASG 2015
Busan, Korea
10 May 2015- 14 May 2015

(Disclaimer)

Special Thanks to:

Lee-Suk Kim, Chair, Organizing Committee

Jun Ho Lee , General Secretary

Program Committee: Sang-Heun Lee, Sun O Chang, See Ok Shin, Sung Hwa Hong, Jong Woo Chung, Sang Min Lee, Jin-Sook Kim

Scientific Committee: Sung Wook Jeong, Chang Hyun Cho, Kyu Yup Lee, Jihwan Woo, Jae-Ryong Kim, Moo Kyun Park, Myung-Whan Suh, Ji Young Lee, Woojae Han, Junghwa Bahng, Kyung Myun Lee

IERASG Council Officers:
John Durrant: Chair
Suzanne Purdy, Vice Chair
Susan Small, Treasurer
Martin Walger, Secretary
David McPherson, Membership Secretary
W. Wictor Jedrzejczak, Website Manager

IERASG Council Members: Jose Barajas, Steven Bell, Andy Beynon, Dusan Butinar, Monica Chapchap, Lionel Collet, Barbara Cone, Cynthia Fowler, Andrew Dimitrijevic, Manuel Don, Ferdinando Grandori, Herbert Jay Gould, Kimitaka Kaga, Lee-Suk Kim, Krzysztof Kochanek, Einar Laukli, Guy Lightfoot, Ozcan Ozdamar, Marilyn C. Perez-Abalo, David Purcell, Joseph Pytel, Mridula Sharma, Yvonne Sininger, George A. Tavartkiladze

Special Sessions:

2 Workshops: Advanced AEP Analysis: Andrew Dimitrijevik; Vestibular Evoked Myogenic Potentials: Toshihisa Mrufushi, Hong-Ju Park, Toruseo Myung-whan Suh

Hallowell Davis Lecture: Terry Picton “Hearing Speech”

Guest Lecture 1: Roger Thornton “Clinical Applications of Temporal Non-Linear Otoacoustic Emissions”

Keynote Lecture 1: Carolyn Brown “New Applications for Auditory Evoked Potentials in Cochlear Implant Users with Residual Acoustic Hearing”

Round Table discussion: R. Burkard (moderator), M. Don, T. Picton, J. Hall, K. Tremblay “Clinical Applications of Auditory Evoked Potentials: Novel Stimuli and Signal-Processing Applications”

Special Sessions, Continued:

Keynote Lecture II: Anu Sharma “Changes in Cortical Resource Allocation in Hearing Loss

Guest Lecture II: Manny Don: Are We at a Loss to Explain How Hearing Loss Affects AEP Measures?”

Keynote Lecture III: Kelly Tremblay “Older Ears and Older Brains: Implications for Clinical Assessment and Rehabilitation”

Invited sessions paralleled topics commonly presented in submitted sessions: CI, ASSR, CAEPs, ABRs, hearing loss, peripheral processing, aging, plasticity

Submitted Presentations:

Oral Presentations: 57

Poster Presentations: 66

Countries represented in presentations (by first author):

18 Countries:

Canada (4), United States (23), United Kingdom (5), Germany (8), Iran (2), China (10), Denmark(6), Korea (32), Poland (6), Belgium (5), Australia(10), Japan (7), Russian Federation (1), The Netherlands (4), New Zealand (4), Indonesia (1), Sweden (1), Malaysia (1)

Total: 130

Thanks to Wordle!

Response Measures:

Acoustic Immittance/Absorbance, DPOAE, TEOAEs (CEOAEs, TBOAEs), Summating Potential, CM, Compound Action Potential (NRT), Promontory eCAP ABR, eABR, Frequency Following Response, ASSR, Post-Auricular Response, MLR, CAEP, Acoustic Change Complex, MMN, P300, N400, P600, MRI, EEG (beta band, theta band, gamma band), MEG, connectivity, VEP, various perceptual measures, audiometry, oVEMP, cVEMP, vHIT, eye movements, single unit responses, anatomical measures, facial nerve response to electrical stimulation (CI), calcium influx (chicken basilar papilla hair cells)

Subjects:

Human: Normal hearing young adults, hearing impaired adults, severe/profound hearing loss subjects (CI users), older subjects, normal-hearing children, newborns, vestibular schwannomas, cortical lesions, TBI (temporal lobectomy), Mumps, vestibular neuritis, tinnitus, congenitally-deaf/late-implanted children hearing aid users, those with cochlear dead regions, mild or high-frequency hearing loss, musicians, children with ASD, auditory neuropathy, sudden hearing loss, Meniere's disease, superior canal dehiscence, auditory processing disorder (children), those with amblyaudia, children with speech delay, children at risk for dyslexia, deaf-blind adults, various SNHL configurations, Pelizaeus-Merzbacher Disease, vertigo, conductive loss in infants, otosclerosis, cochlear nerve aplasia/hypoplasia, those speaking Mandarin and Sichuanhua dialects, American/Korean/Japanese Listeners

Bottlenose dolphin: normal hearing, high-frequency hearing loss

Rats: effects of Atrial Natriuretic peptide

Mice (CBA): ABR/DPOAEs/MOC Efferent Terminals

Guinea Pig: ABR is deaf animal model- human Mesenchymal Stem Cell Transplantation

Chickens: calcium entry into basilar papilla hair cells

Stimuli

clicks, tonebursts, electrical, chirps, speech, paired tones (DPOAEs), SAM tones, multiple SAM tones/chirps, narrow-band noise, speech-shaped noise, speech-weighted noise, speech-like stimulus, bone-conducted stimuli, contralateral suppressors/maskers, clicks-in-noise, clicks-in-high-passed-noise, derived-band responses, Stacked ABR, forward-masked responses, spatially-separated stimuli, synthetic vowel, liquids, speech-in-noise, syllables in noise, digits in noise, non-linear frequency compression of speech, sentences, syntactically correct/semantically incorrect sentences, prosodic changes, visual stimuli, bimodal stimulation-acoustic/electrical, speech/syllables in reverberation, MLD conditions (speech/tones in noise), mistuned harmonics, rotation, frequency change, cross-modal

Measures Most Reported:

CAP (CI)

ABR (chirp)

ASSR

CAEP

Measures Infrequently Reported:

OAEs

CM/SP

MLR

ERPs

MEG

Some other Emphases:

VEMPs/Vestibular: 11 (many from Korean presenters)

Chirps: 15

Speech (like): 28

De-emphasized:

Speech ABR

High-rate (MLS etc)

Multistimuli (ASSR)

Stacked ABR

Picton: Talked about using ecologically-valid stimuli

Speech is special– speech perception the result of thalamocortical processing- core/belt/parabelt

So perhaps speech ABR not so ecologically valid (as brainstem does not appear to specifically process speech), but use of speech stimuli for CAEPs does appear to be very appropriate

Picton talked about the 'What' and 'Where' Systems:

How one identifies what an acoustic object is versus where the sound is coming from

'What' versus 'Where' neural processing is better understood for visual system

Presentations/posters I thought were very interesting included those investigating:

- Multimodal EPs
- Spatial studies involving AEPs
- P2
- Induced activity
- Those looking at chirps in vestibular schwannomas
- Autism spectrum disorder
- dyslexia
- Cochlear implant recipients, both CAP and CAEP
- Those whose language differs from that of the investigators, and musicians (statistical learning)
- Comparison of AEPs and perception

Round Table:

Chirps: Optimal chirp varies with level, and is also dependent on individual variability, hearing loss, possibly sex and with development. Some discussion of issues related to chirps and screening including evidence that sensitivity/specificity no worse than for clicks.

Multistimulus ASSR: Can be affected by hearing loss

Correlational nature of much AEP work: Co-occurrence is not cause-effect

What can we learn from multichannel recordings of AEPs: There are many inverse solutions, so always question of whether the solution provided in the source analysis represents the underlying anatomy/physiology (folks in audience must have been listening)

Manny Don warned us that we must not become complacent. We have made progress in newborn hearing screening/threshold estimation, site of lesion testing, amplification, cochlear implants- yet it is clear that AEPs can tell us more about underlying mechanisms and the nature of diseases/disorders if only one of you can find the right questions to ask, and create the tools to answer those questions.

Although Manny Don worries about complacency, I worry about impatience.

As Professor Kaga told us last night, in the late 1930s, Pauline and Hallowell Davis (and others) reported on the K-complex. Investigation required the development of signal averaging, and multichannel recordings required the development of high-speed computer process that can handle large data sets. Finally, we are recording CAEPs to complex sound (speech) and making some progress towards searching for possible sources of these responses to complex stimuli.

We need to have better computational tools to have more faith in these possible AEP sources, and we need to keep pairing function imaging with MEG/AEP to help validate these emerging approaches.

Don & Eggermont, Roger Thornton (mid/late 1970s): ABR high-pass subtractive masking.

Claus Elberling & Manny Don: 1980s: Fsp (objective, SNR)

Manny Don: Stacked ABR: detect small tumors- 1997

Bench to Bedside: ~20 years

Collaboration and careful investigation

Chirps: Torsten Dau 2002: Lots of investigation and excitement. Let us understand what it is good for and its limitations, and let clinical application follow scientific investigation

But patience has not worked for auditory processing disorders:

More than 50 years of study, no gold standard test, no clear physiological basis, no consensus as to different categories of the disorders, little AEP data that clearly correlates with the behavioral results, and no agreement if this is auditory or attentional. We need young investigators with fresh ideas.

Three of my favorite talks:

Lee Jun An, Brett Martin, Glenis Long: Encoding of /r/ and /l/ by American, Korean, and Japanese listeners using the acoustic change complex
Korean/US collaboration, liquids/ACC, plasticity

Joan Leong, Suzanne Purdy, Paul Corballis:
Cortical auditory evoked potentials in autism spectrum disorders: Using mismatch negativity to investigate perception of changes in affective prosody
Population (ASD), study of emotional prosody

Ji Hye Han, Andrew Dimitrijevic: Noise effect on cortical activity to voice onset time in cochlear implant users
CI, CAEPs, VOT manipulation, masking, perception/AEP comparison, mentoring

Why come to an IERASG meeting in Busan?

Present your hard work, learn new things (science/culture), meet current/future friends/collaborators

I have many friends at IERASG. Collaborations arise- Burkard, Don and Eggermont book was discussed in Vancouver, authors sought out in Havana

What happens between sessions is at least as important as the science: collaborations, resolution of disagreements, finding students, post-docs, faculty, lasting friendships (Einar Laukli, Dusan Butinar, Claus Elberling)

Kamsa-hamnida