PACIFIC JOURNAL OF MEDICAL SCIENCES

{Formerly: Medical Sciences Bulletin}

ISSN: 2072 – 1625

Pac. J. Med. Sci. (PJMS)

www.pacjmedsci.com. Email: pacjmedsci@gmail.com.

LETTER TO THE EDITOR:

USE OF TELEPATHOLOGY FOR HISTOPATHOLOGICAL DIAGNOSIS IN PAPUA NEW GUINEA: A TEMPORARY SOLUTION TO SHORTAGE OF PATHOLOGISTS

***^RODNEY ITAKI, **JACKLYN JOSEPH AND ***CLINT NAPO**

*Division of Pathology, University of Papua New Guinea School of Medicine and Health Sciences, National Capital District; **Department of Pathology, Port Moresby General Hospital, National Capital District; ***PHIL Project National Capital District Port Moresby.

^Corresponding author: ritaki@upng.ac.pg

LETTER TO THE EDITOR:

USE OF TELEPATHOLOGY FOR HISTOPATHOLOGICAL DIAGNOSIS IN PAPUA NEW GUINEA: A TEMPORARY SOLUTION TO SHORTAGE OF PATHOLOGISTS

***^RODNEY ITAKI, **JACKLYN JOSEPH AND ***CLINT NAPO**

*Division of Pathology, University of Papua New Guinea School of Medicine and Health Sciences, National Capital District; **Department of Pathology, Port Moresby General Hospital, National Capital District; ***PHIL Project National Capital District Port Moresby.

^Corresponding author: ritaki@upng.ac.pg

Dear Editor,

Rapid advances in information communication technologies (ICT) have enabled improvements in telepathology. Telepathology has wide applications in developing countries and can be used for primary diagnosis, second opinions, teaching and research [1,2]. Examples of countries that have set up telepathology systems include Solomon Islands, Bangladesh and Cambodia [1]. Papua New Guinea (PNG) has a population of nearly 8 million people with only 16 pathologists and 14 of them are based in Port Moresby, the capital city of PNG. Port Moresby is not connected by road to other towns in PNG hence the only mode of transportation is by air leading to increased costs of transporting surgical specimens to Port Moresby General Hospital (PMGH) where the country's only histopathology service exists. Due to the shortage of pathologists to provide histopathological cancer diagnosis, telepathology has been suggested as a possible solution [3]. A survey by Albert and Garbett showed 70% of PNG health workers interviewed indicated telepathology would be extremely useful in PNG and 64% specified they were willing to access telepathology results using a secure network [4]. However, to date no telepathology initiative has emerged in PNG.

There are different types of telepathology systems; these include static telepathology, dynamic telepathology and hybrid telepathology [1]. The simplest and cheapest type is the static telepathology that involves capturing still images of a histopathology slide and sending it via an email or web portal to pathologists at distance locations that are linked to the network. However, static telepathology is limited by image selection and

image quality. In an international telepathology validation study, the diagnostic concordance of static images versus glass slide diagnosis varied between 82.9% and 92.1% [5]. In that same study 60% of the errors were related to image selection and image quality [5]. Halliday et al [6] analysed 171 static images submitted to an international telepathology service and found the concordance rate to be 88.2%. However, the concordance rate for clinically important cases was 96.5% [6]. The study also found inappropriate image selection, sampling biases by referring pathologists and underestimation of the complexity of the cases by reporting telepathologists that negatively influenced diagnosis by static images [6]. With advanced telepathology technologies, the diagnostic concordance can reach 90% and 100% [7]. Although telepathology is increasingly being implemented in developing and developed countries, it has limitations that vary according to the type of tissue selection and technology used [2]. In resource limited settings, major challenges limiting the establishing of a telepathology service include financial investment in the telepathology hardware and software, dedicated trained personal and the ICT infrastructure in the country [8]. These limitations, however, have not significantly hindered implementation of telepathology services globally as evidenced by the increased implementation of different forms of telepathology [2].

Our research team has recently developed a user friendly internet based telepathology system that we have named “ePathPG” that can be used in PNG. The system uses a web-based image management database that registered pathologists can access remotely to make histopathological diagnosis based on uploaded images. This system uses a static image telepathology model that is user friendly. Registered users can access the images using standard internet connection services or via a 3G or 4G mobile network using smart phones and android devices.

However, the current ePathPG version is a prototype and there is a need to validate it before the system can be accepted for routine remote histopathological diagnosis. We are in the process of implementing a validation study to evaluate the diagnostic concordance of ePathPG using guidelines established by the Telepathology Guidelines Committee of the Canadian Association of Pathologists [9]. The results of the validation study will help refine ePathPG and improve it to an acceptable level for routine use. We are of the opinion that telepathology has a role in the management and control of cancer in PNG in the short to medium term, particularly with respect to improved result-turn-around time, and we think telepathology models for use in PNG needs further exploration.

REFERENCES:

1. Sankaye S, Kachewar S. Telepathology for effective health care in developing countries. Australas Med J, 2011; 4(11):592-5. doi: 10.4066/AMJ.2011.855.
2. Mea VD, Mencarelli R (ed). Proceedings of the 11th european congress on telepathology and 5th international congress on virtual microscopy. Diagnostic Pathology 2013; 8 Suppl 1:1-45.
3. Crouch-Chivers, PR. A review of cancer in Papua New Guinea. PNG Med J 2010; 53 (1-2): 48-53.
4. Albert N, Garbett IK. Feasibility study of telepathology in Papua New Guinea (PNG). Pathology 2009; 41: 83-84.
5. Weinberg DS, Allaert FA, Dusserre P, Drouot F, Retailliau B, Welch WR, Longtine J, Brodsky G, Folkerth R, Doolittle M. Telepathology diagnosis by means of digital still images: an international validation study. Hum Pathol 1996; 27(2): 111-118.
6. Halliday BE, Bhattacharyya AK, Graham AR, Davis JR, Leavitt SA, Nagle RB, Mclaughlin WJ, R Rivas RA Martinez R, Krupinski EA, Weinstein RS. Diagnostic accuracy of an international static-imaging telepathology consultation service. Hum Pathol 1997;28 (1):17-21.
7. Braunhut BL, Graham AR, Richter LC, Webster PD, Krupinski EA, Bhattacharyya AK, Weinstein RS. Fifth generation telepathology systems. Workflow analysis of the robotic dynamic telepathology component. Diagnostic Pathol 2013;8 Suppl 1: S3.
8. Cross SS, Dennis T, Start RD. Telepathology: current status and future prospects in diagnostic histopathology. Histopathology 2002; 41(2): 91-109.
9. Bernard C, Chandrakanth SA, Cornell IS, Dalton J,Evans A, Garcia BM, Godin C, Godlewski M, Jansen GH, Kabani A, Louahlia S, Manning L, Maung R, Moore L, Philley J, Slatnik J, Srigley J, Thibault A, Picard DD, Cracower H, Tetu B. Guidelines from the Canadian Association of Pathologists for establishing a telepathology service for anatomic pathology using whole-slide imaging. J Pathol Infor 2014 28; 5:15. doi: 10.4103/2153-3539.129455.