Forensic Anthropology in Australia: Working Towards Improved Practice

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Introduction

The Forensic Anthropology Scientific Working Group (SWG) in Australia is part of the Medical Sciences Specialist Advisory Group (MSSAG). Compared to other similar international groups, the Forensic Anthropology SWG is a relatively small group consisting of only eight practitioners from each state and territory (except the Northern Territory). Since its formation in 2006, the Forensic Anthropology SWG has implemented a number of initiatives aimed at assessing and developing standards of practice in Australia, including the development of guidelines and a code of ethics for forensic anthropology practitioners. The latest initiative, proficiency testing (PT) as part of a general Quality Assurance Programme (QAP), has been identified by the SWG as an area of priority for the continuing development of the discipline of Forensic Anthropology in Australia. To initiate the PT process, a reference database is required for standardisation assessment. Accessibility to appropriate reference collections of individuals of known age and sex in Australia is problematic, therefore, a trial was undertaken using Computed Tomography (CT)-generated images of skulls. The aims of the PT were to examine the concordance of practitioner responses for the determination of sex and estimation of age and in doing so, comment on the suitability of CT images for general anthropological assessment.

Method

CT images collected as part of routine autopsy procedure at the Victorian Institute of Forensic Medicine (VIMF) were used for the PT. These images are multiplanar reconstructions (surface rendered 3D images) obtained from a Toshiba AquilionTM 16 multidetector (CT) scanner. Skull images of 14 de-identified deceased individuals (6 women and 8 men aged between 30 and 94 years) were randomly selected for assessment. The images were made available to participants to access through a secure server hosted by the Australia New Zealand Policing Advisory Agency National Institute of Forensic Science (ANZPAA NIFS). Forensic Anthropology SWG members were invited to participate and were provided with individual user names and passwords. After accepting the conditions of use, the participants were presented with the images and associated answer boxes (Figure 1).

Twelve images illustrating different anatomical perspectives were provided for each of the 14 individuals. Images could be enlarged by clicking on the respective view. Participants were asked to make a determination and comment on the following aspects: ancestry, sex, age, taphonomic alterations, trauma, pathology, normometric traits and cultural lifestyle markers. The images could be accessed as desired within the two month trial period. Blind results of the trial were collated and assessed by NIFS and compared with the data collected during autopsy. In addition to individual results being returned to the each of the participants, participant’s answers were collated and assessed by NIFS to develop an understanding of the comparative determinations of practitioners.

Results

A total of five out of the eight forensic anthropology practitioners in Australia completed the online trial. The results for sex determination and age estimation only are presented here. Quantitative data for age and sex were determined from the results of 14 comparisons of these practitioners using a total data set of 70 results. Determination of sex was the most problematic for practitioners, with 16% of the 70 responses providing a discordant answer (Figure 2).

Discussion

This finding is unsurprising given the accepted levels of inter-observer variation between practitioners when real skulls are examined (Williams & Rogers 2006). It was noted that some of the routine features used in assessment, such as suture line closure, were either not evident or not used by the practitioners when real skulls are examined (Decker et al. 2011; Franklin et al. 2012) and so, in the case of CT images, may be problematic, especially in cases with insufficient material to make a determination and where understanding the implications of this is important. The results of this first proficiency test or forensic anthropologists in Australia using CT indicate that there is variability in the determination of age and sex, in particular, when 3D images of human skulls are used for assessment.

Conclusion

The online proficiency test offers a significant potential for the development of reference standards for further anthropology based QAP in Australia, and potentially globally.

References


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Figure 1: Screen shot of the online collaborative trial.

Figure 2: Results of the anthropology collaborative trial for the determination of sex.

Figure 3: Results of the anthropology collaborative trial for the estimation of age.