Author’s response to reviews

Title: Association of infant growth with emergence of permanent dentition among 12 year-aged southern Chinese schoolchildren

Authors:

Hai Ming Wong (wonghmg@hku.hk)
Si-Min Peng (tina_pensimin@yahoo.com)
Colman McGrath (mcgrathc@hku.hk)

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Author’s response to reviews:

Dear Ms. Wollmuth,

Thank you for considering our manuscript OHEA-D-17-00519 entitled "Infant growth and permanent tooth emergence at 12 years of age ". With regards to the comments, we provide the following corrections:

Editor Comments:

1. Thank you for including information regarding your ethics approval in the methods section. However, in the Ethics approval and consent to participate section of your Declarations, please provide the full name of the committee that approved this study and a reference number if appropriate.

Response: Thank you for the comment and changes have been made accordingly on Line 116-118, Page 5.

2. Please also include information regarding consent to participate along with the ethics information in this section of the Declarations. In the Ethics and consent to participate section
please clarify that consent to participate was obtained from participants parents or legal guardians. Please also include whether the consent was written or verbal.

Response: Thank you for the comment and changes have been made accordingly on Line 111-114, Page 5, and Line 354-364, Page 15.

3. Please note that the Consent for publication statement refers to consent obtained to include any individual person’s data in any form (including individual details, images or videos). Therefore, please state "Not applicable" in this section as no personal information is provided in your manuscript. The statement regarding authors’ approval of the final manuscript should instead be included in the Authors’ contributions section of the Declarations.

Response: Thank you for the comment and changes have been made accordingly on Line 366-367, Page 15, and Line 388, page 16.

4. While assessing your manuscript in-house, we found several instances where the text displayed similarities to text found in other previously published sources. While we understand that you may wish to express some of the same ideas contained in these publications, please be aware that we cannot condone the use of text from previously published work. Please also note that we are unable to publish previously published text even when the papers share some of the same authors. We would therefore be grateful if you could reformulate and alter some wordings in the sections listed below to resolve the overlap between your manuscript and other sources. Please ensure that, where relevant, these sources are also referenced as appropriate:

Response: Thank you for the comment and changes have been made accordingly.

Background

-Page 4 lines 82-89 displays text similarity with the following article: https://www.karger.com/Article/Abstract/381425
Although some researchers tried to investigate the relationship of childhood growth and subsequent dental caries experience, or tooth eruption, no conclusion can be provided as for a large part of the studies is of cross-sectional design. To our knowledge, no study has been carried out to explore the association between infant growth and the permanent tooth emergence when the subjects grew up. Thus, the current study was designed to investigate if variations of growth during the first year of life had an influence on the emergence of permanent teeth at 12 years old in a sub-sample of a Chinese birth cohort.

Methods

-The method section displays several sentences/sections of overlap with the following:


Response: Thank you for the comment and changes have been made in the method section accordingly as follows, from Line 92, Page 4 to Line 205, Page 9:
Methods

Study population

The oral health survey was of a cross-sectional design which fused into a longitudinal Chinese birth cohort study. The participants were randomly selected from a longitudinal Chinese birth cohort ‘Children of 1997’. ‘Children of 1997’ is the first birth cohort in Hong Kong that recruited 88.0% of all newborns between April 1st and May 31st, 1997 (N = 8,327) [21]. After 13 years’ follow-up, there were 7,381 children remained in the cohort [22]. To our knowledge, this is the first study conducted to investigate the relationship between growth trajectories and erupted permanent tooth number, thus no data can be referred to calculate the sample size. It was estimated that a sample of 470 students would have an 80% statistical power of detecting an odds ratio (OR) of 1.50 in the chance of having complete permanent tooth emergence (estimated at approximately 80%) with 1 unit raises in birth weight z-score, together considering a design effect of cluster sampling and level of significance (alpha) set at 0.05. However, to compensate for possible non-participation, the study sample was increased by 25% to 650 students. All local secondary schools in Hong Kong were the primary sampling units (by law all students are required to attend secondary school). A sample of approximately 10% of all local secondary schools (45 schools) from 18 districts in Hong Kong was selected randomly. Participants of the ‘Children of 1997’ birth cohort were invited to take part in the study within each school. Written consent was obtained from all participants’ parents or legal guardians before the oral examination and verbal assent was obtained from all participants on the examination day. In order to assure confidentiality, a de-identified data file was created after the oral health survey data were merged with medical records at Maternal and Child Health Centers (MCHCs). The protocol for this study was reviewed and approved by the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster (reference number: UW 12-140).

Data collection

Assessment of Tooth Emergence Status

The clinical examination was conducted in the student’s school with within two months before the participant’s 13th birthday. In order to gain adequate visibility during examination, the student were asked to rinse their mouth before they lying supine on portable dental chairs, and then their gingivae were cleaned with gauze to eliminate food debris for proper visibility through examination. Prior to the field survey, two dentists who were blind to the students’ information and the objectives of the study were trained and calibrated by an experienced Paedodontist (HMW) in clinical assessment of the emergence of a tooth. In the field study, dental
examinations were performed using a plane intra-oral disposable mouth mirror with a built in light-emitting diode (LED) light source and a blunt probe. The probe was used to sense or prove the occurrence of newly erupted teeth. The diagnostic criterion for an emerged tooth was when any portion of the crown has perforated the oral mucosa and was visible through the oral mucosa [3, 24]. Records on the status of emergence of the 28 permanent teeth (two incisors, one canine, two premolars, and two molars in each quadrant of the mouth) were filled in the World Health Organization (WHO) oral health assessment form [23]. Congenitally missing teeth were unavailable to assess as this study was conducted in the field where no radiographic equipment was available.

Even though the diagnostic criteria for a tooth has emerged have been clearly stated and discussed prior to field trip survey, it could still be a problem to determine whether a tooth has emerged or not when it was close to erupted or have just barely emerged. To guarantee the consistence within and between examiners, blind duplicate oral exam was conducted among 10% participants who were randomly picked out from the study sample.

Infant Growth and Development Information

The participants’ information on their growth and development was retrieved from the well documented medical records at MCHCs. The data of the ‘Children of 1997’ birth cohort included body weights at birth, and 1, 3 and 12 months of age; information on birth characteristics (gestational age, mode of delivery, and birth-associated congenital conditions, type of hospital), and type of feeding. Five gender-specific growth trajectories were generated according to body weight at different time points (at birth, 1, 3 and 12 months of age) through latent class analysis in the whole cohort through SAS (version 9.1) [22]. Firstly, weights were interpolated to exact ages by linear interpolation using PROC EXPAND procedure. Secondly, maximum-likelihood hierarchical cluster analysis for mixtures of spherical multivariate normal distributions was carried out for those individuals with complete weight measures at 4 time points (at birth, 1, 3 and 12 months of age). Thirdly, the probabilities of each individuals belonging to each trajectory were determined [22]. The five trajectories were: Trajectory I had a lower-to-average birth weight and a decelerated growth rate; Trajectory II had a lower-to-average birth weight and a mean growth rate; Trajectory III had a birth weight similar to the WHO average and an accelerated growth rate; Trajectory IV had a birth weight similar to the WHO average and a mean growth rate; and those in Trajectory V had a higher-to average birth weight and an accelerated growth rate [25]. Each student was categorized into one trajectory group exclusively. Growth rates from birth to 3 months of age and 3 to 12 months of age were divided based on the differences on weight z-score. Z-score equals to the difference of the individual weight and median weight of the population divided by the standard deviation of the population.
Socio-demographic Status

Socio-demographic status, with regards to child’s gender and parental educational attainment, was extracted from the medical records at MCHCs.

Statistical analysis

Data of tooth emergence status from the oral health survey at 12 years old were combined with data from ‘Children of 1997’ in terms of birth characteristics, body weight during the first year of life, growth trajectories, and socio-demographic status. Descriptive statistics were used to summarise demographic data in terms of birth characteristics, socio-demographics and permanent tooth emergence through t-test or ANOVA for continuous data, and χ² test for categorical variables. Included participants were those with growth trajectories. Those without data on growth trajectories were excluded. Variance on demographic data between the included and the excluded students were compared.

The association of infant growth with permanent tooth emergence at 12 years of age was examined through logistic regression models. The permanent tooth emergence was the dependent variable, with code 1 as the complete emergence group and 0 as the incomplete emergence group. The main independent variables were growth variables- growth trajectories and growth rates (from birth to 3 months of age, and from 3 to 12 months of age). We put these two growth variables in the model separately. The co-variables in the study, obtained from MCHCs were: (a) birth characteristics: gestational age (37, 38, 39, 40, or ≥ 41 weeks) and mode of delivery (natural labour, assisted natural labour, cesarean birth); (b) health status (presence or absence of congenital conditions; (c) highest parental educational attainment (≤ 9th grade, 10th – 11th grade, or ≥ 12th grade); (d) type of feeding (never breastfed, exclusively breastfed 3 months or partially breastfed, exclusively breastfed for 3 months or more), and (e) student’s gender. Furthermore, models were additionally adjusted for birth weight z-score so as to differentiate the growth effect irrespective of the birth weight. The OR was reported with 95% confidence intervals (CI).

Further analyses at the tooth level were performed if significant differences were found in logistic regression analyses at the subject level. Statistical analysis was performed using IBM SPSS Statistics 20.0 (SPSS Inc., Chicago, Illinois, USA).
Results

-Paragraph 1

Response: Thank you for the comment and changes have been made as follows on Line 207-216, Page 9:

The response rate was 76.9% with 514 out of 668 students agreed to participate in this study. Four hundred and eighty-five of those 514 students had the complete profile on birth characteristics (Table 1). Among the 514 students, there were 241 boys and 244 girls. Included participants had higher weight-for-age z-score at birth, 3 months and 12 months than the excluded (p < 0.05). Children included in the study had higher proportion of nature birth and less proportion of caesarean birth (p < 0.05). No significant difference was found in other information in terms of gender, health status at birth, type of feeding, parental education attainment, or oral health data among participants and non-participants (p > 0.05), see Table 2.

5. Please ensure that when you upload your revised submission that it is in the final form for publication. Please remove any tracked changes or highlighting and include only a single clean copy of the manuscript. Should you wish to respond to these revision requests, please include the information in the designated input box only.

Response: The uploaded revised manuscript is the final form for publication without any tracked changed or highlighting.

6. Please also ensure that your tables are uploaded with your revised manuscript.

Response: The tables uploaded are with the revised manuscript.

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For the 'Availability of data and materials' section, please provide information about where the data supporting your findings can be found. We encourage authors to deposit their datasets in publicly available repositories (where available and appropriate), or to be presented within the manuscript and/or additional supporting files. Please note that identifying/confidential patient data should not be shared. Authors who do not wish to share their data must state that data will not be shared, and provide reasons for this in the manuscript text. For further guidance on how to format this section, please refer to BioMed Central's editorial policies page –

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Declarations

- Ethics approval and consent to participate
- Consent to publish
- Availability of data and materials
- Competing interests
- Funding
- Authors' Contributions
- Acknowledgements
- Authors' Information
Response: Thank you for the comment and changes have been made accordingly from Line 350, Page 15 to Line 389, Page 17.

Thank you very much for your consideration.

Yours sincerely,

Dr Hai Ming WONG

DDS, MDSc, AdvDipPaediatrDent, PhD, M Paed Dent RCSEd, MRACDS (Paed), FCDSHK (Paed Dent), FHKAM (Dental Surgery), FDS RCSEd

Clinical Associate Professor

Paediatric Dentistry & Orthodontics,

Faculty of Dentistry,

The University of Hong Kong

2/F Prince Philip Dental Hospital,

34 Hospital Road,

Hong Kong

Tel.: +852-28590249

Fax.: +852-25593803

E-mail: wonghmg@hku.hk