Acoustic and Perceptual Analyses of Adductor Spasmodic Dysphonia in Mandarin-speaking Chinese

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Summary: Objective. The objective of this study was to examine the perceptual structure and acoustic characteristics of speech of patients with adductor spasmodic dysphonia (ADSD) in Mandarin.

Study design. Case-Control Study

Materials and Methods. For the estimation of dysphonia level, perceptual and acoustic analysis were used for patients with ADSD (N = 20) and the control group (N = 20) that are Mandarin-Chinese speakers. For both subgroups, a sustained vowel and connected speech samples were obtained. The difference of perceptual and acoustic parameters between the two subgroups was assessed and analyzed.

Results. For acoustic assessment, the percentage of phonatory breaks (PBs) of connected reading and the percentage of aperiodic segments and frequency shifts (FS) of vowel and reading in patients with ADSD were significantly worse than controls, the mean harmonics-to-noise ratio and the fundamental frequency standard deviation of vowel as well. For perceptual evaluation, the rating of speech and vowel in patients with ADSD are significantly higher than controls. The percentage of aberrant acoustic events (PB, frequency shift, and aperiodic segment) and the fundamental frequency standard deviation and mean harmonics-to-noise ratio were significantly correlated with the perceptual rating in the vowel and reading productions.

Conclusions. The perceptual and acoustic parameters of connected vowel and reading in patients with ADSD are worse than those in normal controls, and could validly and reliably estimate dysphonia of ADSD in Mandarin-speaking Chinese.

Key Words: Adductor spasmodic dysphonia–Perceptual voice rating–Mandarin–Acoustic–Phonatory breaks.

INTRODUCTION

Adductor spasmodic dysphonia (ADSD), the most common subtype of spasmodic dysphonia (SD) due to movement impairment of the larynx, is characterized by intermittent voice breaks, and blockages in phonation resulting from an instability of vocal fold adductor movement are the primary symptoms.[1–3]

Aberrant acoustic events analyses, such as phonatory breaks (PBs), frequency shifts (FSs), and aperiodic segments (ASs) are considered as primary characteristics of voice in the speech of ADSD. These assessments were used to objectively present and evaluate the speech disorder of ADSD in several studies.[4–9] The standard deviation of the fundamental frequency (F_0SD),[10] shimmer,[3] cepstral peak prominence (CPP)[11] and the harmonics-to-noise ratio (HNR)[12] also give further information on sound alteration. Sometimes, they were used in voice assessment for patients with ADSD. Higher F_0SD and shimmer and lower CPPs and HNR were found in sustained vowel production of patients with ADSD compared with normal controls.[3,10–12] The perceptual evaluation also was a traditional tool used for the assessment of patients with dysphonia in a voice clinic, in which speech-language pathologists can gain information relevant to diagnostics and evaluation.[13–15] In previous studies, there are several scales for perceptual evaluation of ADSD, such as the unified SD rating scale,[16] computer-implemented visual analog scaling,[17] the seven-point equal-interval scale,[10] IINFVo (Impression, Intelligibility, Noise, Fluency, and Voicing) perceptual rating scale, and 7- and 10-cm visual analog scale.[18] These perceptual scale scores mostly were higher in the sustained vowel or connected reading productions of patients with ADSD compared with normal controls.[10,16–18] The previous study also revealed which CPPs and acoustic aberrant events of reading productions are correlated to roughness and breathiness in patients with ADSD.[11] Furthermore, the perceptual scores mostly are correlated with acoustic parameter values in the vowel and reading productions of patients with ADSD.[3–5,10]

The studies of acoustic and perceptual characteristics in ADSD mostly were performed in English, which is a nontone language. However, no published study has investigated the clinical voice characteristics of ADSD in a population of tonal language speakers, for example, Mandarin. No reliable study that analyzes the relationship between acoustic and perceptual characteristics of ADSD voice in Mandarin has been found.

The goals of this study were to describe the acoustic and perceptual characteristics of ADSD voice and to analyze the relationship between both in Mandarin speakers.

MATERIALS AND METHODS

Participants

Voice samples from consecutive patients with ADSD were selected from a database of audio recordings in Guangdong General Hospital.

Accepted for publication December 14, 2017.

This work was supported by the Natural Science Fund of Guangdong China (2015A030313534), http://pro.gdstc.gov.cn/egrantweb/.

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Journal of Voice, Vol. 33, No. 3, pp. 333–339

0892-1997

https://doi.org/10.1016/j.jvoice.2017.12.007

Twenty patients (16 women and 4 men; age 32 ± 9 years; range, 19–59 years) and age- and sex-matched normal controls were involved in the present study. The normal control groups consisted of 20 medical staff and relatives of patients who have no history of a voice disorder, hearing loss, or any disability that might affect their speech and voice. They were all native speakers of Mandarin Chinese. All subjects with ADSD were diagnosed by an otolaryngologist and a speech-language pathologist. Videolaryngostroboscopy confirmed a spasmodic vocal fold vibration in patients with ADSD. All controls had no history of neurologic disorder or vocal fold pathology and were judged to fall within normal voice limits by a speech-language pathologist.

Voice stimuli and recordings

Each participant was recorded while producing a sustained vowel /a/ three times at a comfortable speaking level, which was routinely used in the evaluation of voice disorder,[7,12] and reading a stimuli passage that was widely used in the clinical evaluation of ADSD in Mandarin.[19] The recordings were made in a quiet clinical room. The vowel and reading productions were recorded using a high-quality condenser microphone (Shure SM81; SHURE Inc. Niles, IL) positioned approximately 10 cm from the left corner of the mouth. The speech signals were then preamplified and digitized using Roland Edirol USB Audio Capture (UA-25; Roland Ltd, Swansea, UK) with a sampling rate of 44 kHz. The signal was stored in a computer system. The central 3-second portion of the sustained vowel samples was analyzed using *PRAAT* (version 5.3.56, Paul Boersma and David Weenink, Amsterdam, Netherlands), a software package for processing speech signals. A total of 360 samples (40 subjects times one vowel productions and 40 subjects times eight words) were analyzed.

Perceptual ratings

Perceptual ratings of overall severity, breathiness, roughness, and brokenness in sustained vowels and overall fluency in speech reading were made on a four–equal-point scale with 0 being normal, 1 being mild, 2 being moderate, and 3 being severe, which were used in the evaluation of ADSD voice and speech in Mandarin.[11,17,20] The four attributes rated were among the most commonly reported attributes in the publications. The overall severity, roughness, and breathiness were from CAPE-V scales.[11,21] The brokenness is the audible occurrence of the unexpected momentary absence of the voice signal perceived in voicing across the speech sample. The overall fluency is a general perceptual impression of an appropriate degree of prompt, smooth, easy, and continuous forward flow of speech exhibited across the reading sample.[17]

Two listeners judge 360 samples assembled in random order. The listening procedure was performed twice by each listener to obtain test-retest reliability. The listeners were two experienced speech-language pathologists who are familiar with ADSD and were blinded to the identity of the patients. Intralistener reliability was evaluated by 360 vowel and reading samples from patients with ADSD and controls. Interlistener reliability was evaluated by comparing scaling values from two listeners for all samples.

Acoustic measures and analysis

Vowel acoustic analysis

All analysis was made by the *PRAAT* (version 5.3.56) software[22] downloaded from http://www.praat.org. Each vowel sample was analyzed for 3 seconds. F_0, F_0SD, and mean harmonics-to-noise ratio (MHNR) parameters were directly analyzed for sustained vowel using *PRAAT*.[4]

The following 11 parameters were measured manually by two measurers with *PRAAT*.

Vowel duration

Vowel duration was defined from the sustained vowel productions as the duration, from vowel onset to offset. If a PB, FS, or AS occurred in the vowel sample, its duration was considered part of the total vowel duration.[5,7]

Voiced segment duration

Voice segment duration (VSD) was defined from the voicing onset to voicing offset within the words. If a PB, FS or ASs occurred during the word production, its duration was considered part of VSD if no audible breath occurred.[5,7]

Duration of phonatory break

A PB was defined as an absence of voicing, last more than 50 ms, in the middle of vowel phonation. The duration of the PB was measured in milliseconds) by placing cursors at the initiation and termination of the PB within sustained vowel or syllable vowel production.[5,7]

Percentage of phonatory breaks during vowel production

The percentage of PBs that occurred within each sustained vowel production was calculated by dividing the sum of the duration of PB found within the vowel sample by the vowel duration.[5,7]

Percentage of phonatory breaks during reading

The percentage of PBs that occurred within reading was calculated by dividing the PB duration that was found within all words by the sum of the VSDs.[5,7]

Duration of frequency shifts

An FS was defined as a change of 50 Hz or more in F_0 that occurred within 50 ms. The duration of the FS was measured in milliseconds by placing cursors at the initiation and termination of the phonatory FS within sustained vowel or syllable vowel production (with the help of *PRAAT*).[5,7]

Percentage of frequency shifts during vowel production

The percentage of FSs that occurred within each sustained vowel production was calculated by dividing the sum of the FS duration that occurred within the vowel sample by the vowel duration.[5,7]

Percentage of frequency shifts during reading

The percentage of FSs that was found within reading was calculated by dividing the FS duration that occurred within all words by the sum of the VSDs.[5,7]

Duration of aperiodic segments

An AS was defined as a segment consisting of nonrepetitive cycles within a vowel. The duration of an AS was measured in milliseconds by placing cursors at the initiation and at the end of the AS within sustained vowel or syllable vowel production.[5,7]

Percentage of aperiodic segments during vowel production

The percentage of ASs that were found within each sustained vowel production was calculated by dividing the sum of the AS duration that occurred within the vowel sample by the vowel duration.[5,7]

Percentage of aperiodic segments during the reading

The percentage of ASs that were founded within the reading was calculated by dividing the AS duration that occurred within all words by the sum of the VSDs.[5,7]

Statistical design

The statistical analysis was done using *SPSS 19.0 for Windows* (SPSS, IBM Corp, China). The Kolmogorov-Smirnov statistic was conducted to check that the data were normally distributed. To evaluate the statistically significant difference in the perceptual scores and acoustic measurement between patients with ADSD and controls, and between the vowel and reading, t test and Wilcoxon signed-rank tests were used according to data distribution. Alpha inflation due to multiple comparisons was controlled according to the Bonferroni approach; the data at a probability level of P value $0.1/10 = 0.01$ was used to test for statistical significance. Spearman correlation analysis was used to detect the relationship between perceptual and acoustic evaluations. Data were presented as median (interquartile range) for data of abnormal distribution.

TABLE 1.
Spearman *r* Correlation Coefficients for Intrameasures and Intermeasures Reliability in Perceptual and Aberrant Acoustic Events

	Intrameasure	Intermeasure
Perceptual		
Overall severity of vowel	0.93	0.90
Breathiness of vowel	0.83	0.93
Roughness of vowel	0.83	0.79
Brokenness of vowel	0.95	0.91
Overall fluency of reading	0.97	0.94
Aberrant acoustic events		
PB of vowel	1.00	1.00
FS of vowel	0.83	0.86
AS of vowel	0.95	0.96
Duration of vowel	0.99	0.99
PB of reading	1.00	0.81
FS of reading	0.98	0.83
AS of reading	0.98	0.88
Total of reading VSD	0.89	0.88

TABLE 2.
The Difference Between Patients with ADSD and Controls in Perceptual Parameters

	ADSD	Controls	*P* Value
Overall severity of vowel*	2.0 (1.6–2.5)	0.3 (0–0.5)	0.000†
Breathiness of vowel*	0.3 (0–1.0)	0 (0–0)	0.006†
Roughness of vowel*	1.5 (1.0–2.0)	0 (0–0)	0.000†
Brokenness of vowel*	2.0 (1.1–2.4)	0 (0–0.5)	0.000†
Overall fluency of reading*	1.5 (1.0–2.0)	0 (0–0)	0.000†

* Median (interquartile range).
† $P < 0.01$.

RESULTS

Perceptual evaluation

Intrajudge and interjudge reliabilities were analyzed for the perceptual ratings of overall severity, breathiness, roughness, and brokenness in sustained vowels and overall fluency in speech reading. Spearman r correlation coefficient measures showed high intrameasurer reliability ranging from $r = 0.83$ to $r = 0.97$, and intermeasurer reliability also was high, ranging from $r = 0.79$ to $r = 0.94$ (Table 1).

Table 2 shows the results of the rating scores for the five perceptual parameters: overall severity, breathiness, roughness and brokenness of sustained vowels, and overall fluency of reading in patients with ADSD and in controls. The median scores for overall severity, roughness, breathiness, and brokenness were 2.0, 1.5, 0.3, and 2.0 in sustained vowel of ADSD, but 0.3, 0, 0, and 0 in controls. Median score of overall fluency in reading are 1.5 in the reading of ADSD but 0 in controls. There was a significant difference between the patients with ADSD and controls for overall severity ($P = 0.000$), roughness ($P = 0.000$), breathiness ($P = 0.005$), and brokenness ($P = 0.000$) in the sustained vowel and overall disfluency parameters in the reading ($P = 0.000$) (Table 2). The overall fluency of reading is significantly correlated with ratings of vowel overall severity ($r = 0.083$, $P = 0.000$), brokenness ($r = 0.802$, $P = 0.000$), roughness ($r = 0.745$, $P = 0.000$), and breathiness ($r = 0.616$, $P = 0.000$).

Acoustic analyses

Acoustic parameters

The t test revealed that value of F_0SD was significantly higher for the ADSD group than for the control group ($P < 0.01$), and MHNR was lower for the ADSD group than for the controls (Table 3).

Vowel production and reading

The duration of the sustained vowel was 5001 (4603–5998) ms, and the sum of VSDs was 10,996 (10,395–12,461) in the ADSD group.

TABLE 3.
The Difference Between Patients With ADSD and Controls in Acoustic Parameters

	ADSD	Controls	*P* Value
F0 (Hz)*	245.0 ± 97	269.0 ± 76	0.388
F_0SD (Hz)*	31.6 ± 29.1	2.5 ± 0.9	0.000‡
MHNR (dB)*	15.6 ± 7.0	23.0 ± 3.2	0.000‡
Phonatory breaks in vowel (%)†	0 (0–0)	0 (0–0)	0.602
Frequency shift in vowel (%)†	1.2 (0–2.4)	0 (0–0)	0.001‡
Aperiodic segment in vowel (%)†	0.7 (0–11.1)	0 (0–0)	0.004‡
Phonatory breaks in reading (%)†	1.0 (0–2.8)	0 (0–0)	0.001‡
Frequency shift in reading (%)†	6.0 (3.8–9.2)	1.8 (0.6–3.6)	0.000‡
Aperiodic segment in reading (%)†	8.1 (2.6–13.4)	0.7 (0.4–2.5)	0.000‡

* Mean ± standard deviation.
† Median (interquartile range).
‡ $P < 0.01$.

The sum of VSDs was significantly greater for the ADSD group than for the control group ($P = 0.000$). The duration of PB, FS, and AS during sustained vowel production were respectively 0, 80 (0–119) and 40 (0–690) ms, and the duration of PB, FS and AS during connected reading production were 82 (0–226), 789 (449–984), 982 (286–1474) ms for the ADSD group. The percentage of FS and AS during vowel production was significantly greater for the ADSD group than for the control group ($P = 0.004$ and $P = 0.001$, respectively), but the percentage of PB ($P = 0.602$). On the other hand, the percentage of the PB, FS, and AS during the reading were significantly greater for the ADSD group than for the control group ($P = 0.001$, $P = 0.000$, and $P = 0.000$, respectively) (Table 3).

No segment of phonation was classified more than once. Intrameasure reliability was analyzed for the measurements of FS, PB, AS, and VSD. Intrameasurer reliability was done on approximately 87.5% of the samples (n = 315). Spearman *r* correlation coefficient measures showed high intrameasurer reliability ranging from $r = 0.83$ to $r = 1.00$. The lowest correlation coefficient was analyzed for the duration of FSs in the vowel ($r = 0.83$). PBs were the most accurately identified ($r = 1.00$). Intermeasurer reliability was analyzed on 30% of the samples (n = 108). The Spearman *r* correlation coefficient measures for intermeasurer reliability also were high, ranging from $r = 0.81$ to $r = 1.00$ (Table 1).

Sustained vowel versus reading within the ADSD group

When comparing the overall fluency of reading and the overall severity of the vowel, the results indicated that, in the patients with ADSD, speech reading was perceived as significantly higher rating than sustained vowel productions ($Z = -3.5$, $P = 0.000$).

No statistical difference was found between sustained vowel and speech reading for the percentage of ASs and PBs ($P = 0.016$, $P = 0.167$). The percentage of FSs during reading production was significantly greater than that during sustained vowel production ($P = 0.001$) (Table 4).

Correlations among perceptual ratings and acoustic parameters

Between acoustic parameters

The percentage of PB, FS, and AS in vowel significantly correlated with the percentage of PB, FS, and AS in connected reading (Table 5). The percentage of PB in patients with ADSD was not significantly different from controls, so the percentage of FS and AS in sustained vowel were more concerned. The percentage of FS in connected reading production was alone correlated with the percentage of FS, not other acoustic parameters in sustained vowel production. The percentage of AS in connected reading production was significantly correlated with F_0SD, MHNR, and all aberrant acoustic parameters in vowel production. The percentage of FS in connected reading production also was correlated with F_0SD and all aberrant acoustic parameters, not MHNR in sustained vowel production (Table 5). F_0SD was significantly correlated with MHNR and the percentage of AS in vowel ($r = -0.716$, $P = 0.000$, and $r = 0.436$, $P = 0.006$). MHNR also was significantly correlated with the percentage of AS in the vowel ($r = -0.541$, $P = 0.000$).

TABLE 4.
Voice Acoustic Instability Events and Perceptual Parameters Comparison Between the Reading and Sustained Vowel in Patients With ADSD

	Sustained Vowel	Speech Reading	*Z*	*P* Value
Phonatory breaks (%)*	0 (0–0)	0.7 (0–1.87)	−2.42	0.016
Frequency shifts (%)*	1.23 (0–2.35)	5.87 (4.00–8.78)	−3.25	0.001†
Aperiodic segments (%)*	0.68 (0–11.06)	8.00 (2.56–11.60)	−1.38	0.167
Events sum (%) *	2.15 (0–18.85)	16.09 (8.12–20.45)	−1.27	0.204

* Median (interquartile range).
† $P < 0.01$.

TABLE 5.
Coefficient Value of Spearman Correlation for Acoustic Parameters of Sustained Vowel and Reading Production

	Percentage of Phonatory Breaks in Reading (%)	Percentage of Frequency Shifts in Reading (%)	Percentage of Aperiodic Segments in Reading (%)
Sustained vowel			
F_0SD	0.595†	0.289	0.467†
MHNR	−0.304	−0.110	−0.573†
Percentage of phonatory breaks (%)	0.328*	0.054	0.366*
Percentage of frequency shifts (%)	0.520†	0.465†	0.499*
Percentage of aperiodic segments (%)	0.496†	0.229	0.456†

* $P < 0.05$.
† $P < 0.01$.

TABLE 6.
Coefficient Value of Spearman Correlation for Perceptual Rating and Acoustic Parameters

	Overall Severity of Vowel	Brokenness of Vowel	Roughness of Vowel	Breathiness of Vowel	Overall Fluency of Reading
F_0SD	0.650†	0.490†	0.664†	0.180	0.639†
MHNR (dB)	−0.766†	−0.654†	−0.747†	−0.440†	−0.679†
Vowel					
Phonatory breaks (%)	0.365*	0.304	0.348*	0.403†	0.404†
Frequency shifts (%)	0.598†	0.663†	0.439†	0.375*	0.654†
Aperiodic segments (%)	0.694†	0.715†	0.613†	0.535†	0.690†
Reading					
Phonatory breaks (%)	0.564†	0.583†	0.479†	0.640†	0.751†
Frequency shifts (%)	0.264	0.301	0.134	0.202	0.342*
Aperiodic segments (%)	0.593†	0.664†	0.477†	0.444†	0.578†

* $P < 0.05$.
† $P < 0.01$.

Between perceptual and acoustic parameters

The perceptual overall fluency in connected reading was significantly correlated with all acoustic parameters. The perceptual assessments in the sustained vowel are significantly correlated with MHNR, the percentage of FS and AS in vowel production, and the percentage of PB and AS in reading production. Other than F_0SD was correlated with the perceptual rating of overall severity, brokenness, and roughness, not breathiness in vowel production (Table 6).

DISCUSSION

ADSD has been defined as a dysphonia that is characterized by action-induced, task-specific hyperadduction of the vocal fold. The patients usually phonate “irregular stoppages” or “breaks in vocalization” voice in speech. For perceptual rating, the roughness, breathiness, brokenness, or overall severity of sustained vowel and fluency of reading mostly were applied in dysphonia assessments of patients with ADSD in English.[5,10,16,18,23] Our study found that the Chinese patients with ADSD had more roughness, breathiness, brokenness, and overall severity in sustained vowel perceptual rating, worse fluency in speech reading perceptual rating compared with normal controls. There are similar results in previous nontonal language studies.[5,16,23]

MHNR measures of biomechanical vibratory properties of vocal cords in the voice. F_0SD is a reflection of laryngeal stability.[6,8,9] Both have been documented to be significantly worse in patients with ADSD than controls in previous studies.[3,4,24,25] In our study, the MHNR of patients with ADSD was lower than controls, and the F_0SD of patients with ADSD were higher than that of controls. The difference between patients and normal controls is similar to nontonal languages is similar to nontonal languages, such as English.

For aberrant acoustic events, measurements mostly were applied in dysphonia assessments of patients with ADSD in English, such as PB, FS, and AS.[5,7,11,23,26] Sapienza’s study indicated that the percentage of PB and AS of ADSD reading production were not significantly different from controls, but the percentage of FS of reading production, the percentage of PB, AS, and FS of sustained vowel production were significantly more than controls.[5] Langeveld found that proportion of PB and AS of sustained vowel in patients with ADSD were significantly higher than that in controls in Netherlander.[25] In the present study, there was significantly more the percentage of FS and AS in sustained vowel, and the percentage of PB, FS, and AS of reading in patients with ADSD than controls. Some perceptual characteristics of ADSD in French participants were not found in English patients with SD and vice versa.[26] For Mandarin, the linguistic specific or vocal tract features differences between nontonal and tonal language speakers, and may affect voice disorders in patients with ADSD.

When comparing the results for the sustained vowel and speech reading tasks, in previous studies, listener ratings of dysphonia indicated that, in the patients with ADSD, speech reading was perceived as significantly higher than sustained vowel productions.[18] In the present study, there were similar results in which speech reading was perceived as having a significantly higher rating than sustained vowel productions in patients with ADSD. For acoustic aberrant events proportion, in the previous study, a significantly greater percentage of PB, FS, and AS durations were produced during the sustained vowel than reading.[5,7] In the present study, a greater percentage of FS was produced during reading than the sustained vowel, not the percentage of PB and AS. Perhaps we used a phonetic context that maximally provokes symptom expression in ADSD.[19] The debate about which type of speech task is better suitable for the evaluation of speech function in patients with ADSD is subdued in Mandarin speakers.

Based on previous studies,[5,7,11,23] F_0SD, MHNR, FS, and AS in sustained vowel and PB, FS, and AS in speech reading are major acoustic measurements related to vocal fold movement and laryngeal muscle controls, and can estimate the perceptual disfluency and voice quality for ADSD speakers in English. The previous study shows that an increase in phonation breaks, ASs, or FSs is associated with poorer perceptual roughness and breathiness in the sustained and connected speech.[11] In the present study, the correlations between perceptual rating and F_0SD, MHNR, or percentage of acoustic aberrant events duration were analyzed for mutual confirmation of measurements. An increase in the percentage of FSs or ASs of the vowel was associated with poor performance in perceptual rating brokenness or overall severity of vowel. Overall fluency also can be moderately estimated by the percentage of PB, FS, or AS duration in connected reading for the patients with ADSD in Mandarin. F_0SD and MHNR were correlated with most of the perceptual rating of sustained vowel and reading production for patients with ADSD. This finding would confirm the suggestions of Siemons-Luhring et al. That acoustic measures are related to the perceptual rating of speech disfluency and voice quality in patients with ADSD and can measure specific voice dimensions in ADSD voicing.[4]

CONCLUSIONS

We presented a profile of ADSD in Mandarin. The MHNR, F_0SD, FSs, and ASs of the connected vowel, and the PBs, FSs, ASs of speech reading production in the patient with ADSD were worse than those of normal controls. The acoustic measurements have a good consistency with perceptual rating evaluation in Mandarin. The aforementioned acoustic measurements and perceptual rating assessments can be used to evaluate the dysphonia of patients with ADSD in Mandarin.

APPENDIX

The connected reading for stimuli dysphonia of ADSD patients in Mandarin

Mandarin phoneticize:	pǐng guǒ	huǒ chē	shì de	nǐ shì gè hǎo rén
Mandarin:	苹 果	火 车	是 的	你 是 个 好 人。
Translation in English:	Apple	Train	Yes	You are good man.

wǒ mén nà biān yǒu wǎng qiú chǎng、cān gǔan、jiǔ bā、hé yīgè miàn bāo dìan
我 们 那 边 有 网 球 场、餐 馆 、酒 吧 和 一个 面 包 店.
There are a tennis court, restaurant, bar and bakery in our facilities.

tā shì dūo me kāng kǎi a
他 是 多 么 慷 慨 啊
He is so generous.

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