

CARDIOVASCULAR RESPONSES TO EXPERIMENTAL CHEWING

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Cardiovascular responses (CVR) to general muscular activity in the human body have been extensively investigated, but negligible attention has been paid to such responses to jaw muscle activity though it is reasonable to expect similar changes in response to protracted activity of masticatory muscle such as continued chewing. The aim of this study was to ascertain the cardiovascular responses to chewing activity in young healthy volunteers and to compare the CVR of the chewing of gums of two different consistencies. In addition to this, variation in the time- point for the muscles of mastication in healthy adults to become fatigued was studied.

Ten healthy men ranging in age from 22 to 28 performed two chewing sessions: chewing a hard gum and chewing a soft gum on two separate days. They were asked to chew on their most convenient side at a normal pace (cycles/min). Heart Rate (HR) systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured 15 min, 10 min and 5 min before the commencement of chewing. Then each subject was asked to chew gums for 15 min. and HR SBP and DBP were measured at five-minute intervals during this chewing period. Then they were asked to stop chewing and to have the gum inside the mouth for ten minutes as the HR, SBP and DBP were recorded at two minutes intervals. During the chewing period, time taken for them to feel any kind of discomfort or pain indicating the onset of fatigue was measured.

Mean baseline HR and SBP of two sessions were not significantly different ($P < 0.2$ and < 0.65). With the soft gum mean HR increased by about 14 beats/min, mean SBP by 10 mmHg and mean DBP by about 9 mmHg. With the hard gum mean HR increased by 14 beats/min, mean SBP by 10 mmHg and mean DBP by 10 mmHg. These changes were highly statistically significant ($P < 0.0001$). Difference of increases in mean HR and mean SBP with chewing of soft and hard gums was not statistically significant ($P < 0.16$ and < 0.47). But the difference of mean increases in DBP with two types of gums is marginally significant ($P < 0.025$) which is not totally valid as the mean baseline DBP of two sessions were slightly different. During the recovery both SBP and DBP drops down to the resting level within ten minutes but HR tend to be slightly elevated even after 15 minutes. These CVR with both types of gums poorly correlate with the chewing rate and comfortable time of chewing, which may be a result of the small sample size.

The results of this study reveal that chewing activity is associated with general cardiovascular responses. Negligible difference of cardiovascular responses (CVR) between soft and hard gums may be attributed to the fact that the consistencies of these two types of gums are not significantly different. Further studies are essential to understand the nature of the association between chewing activity and CVR.