

Research Article

Survey on the Rate of Occurrence of Rumination (Merycism) In People with Disabilities

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Abstract

Although rumination in humans has been known for a long time, fundamental countermeasures have not yet been established. The purpose of this research was to clarify the percentage of people with rumination and their oral condition by conducting a large-scale survey of 27,661 males and 18,277 females (total 45,938) in the 789 of 1929 facilities for the disabled (recovery rate 43.0%) that responded in January to February of 2017 to our questionnaire on rumination. As a result, the number of ruminants was 753 (1.6%) (605 men, 2.2%, 148 females, 0.8%) of the 45,938 subjects. The highest age group was 231 people (31.8%) in their 40's. Mental retardation and autism were common in those with the ruminant disability.

Most people were ruminating immediately after a meal, followed by those who did so 30 minutes after the meal and then those who were doing it at any time. The oral condition was poor due to high caries incidence and bad breath. However, some ruminants did not recognize these symptoms. The reason for this was considered to be influenced by the degree of rumination and the caregiver's career for ruminants.

Introduction

Rumination is a feeding behavior in which herbivorous animals such as cows and sheep regurgitate the staple food of grass (cellulose) many times between the mouth-stomach for fermentation/digestion by special microorganisms in the stomach.

The first clinical description of human rumination was reported in 1618, after the death of a person who ruminated like a cow, followed by autopsy to confirm whether there were many stomachs [1].

After that, until the early 1900s, rumination was recognized as a human degenerative phenomenon and reported as a spectacle of shows and circuses [2]. Since full-scale research and treatment has been ongoing since 1950, there are several reports, mainly in medicine, psychiatry and behavioral therapy [3]. Currently, the medical definition of rumination is described in the criteria for rumination disorder diagnosis by DSM-IV-TR of the American Psychiatric Association [4] and the diagnostic criteria of Rome III rumination syndrome of the International Gastroenterology Society 2006 [5].

In addition, for general healthy people who can control rumination, there is no description of it being a disease. In the report on the rumination of severely handicapped persons, 8% had rumination in the mental retardation facility [6]. It was found in 14% of the autistic disabled with university hospital consultation [7]. The correlation between caries and the bacterial flora in saliva was recognized [8]. The number of cases and their oral condition has been reported in very limited populations.

It has been known for a long time that these ruminants are found in the intellectually disabled, and bad breath and acid erosion are likely to occur regardless of the degree of oral care by caregivers, and special consideration has been required to cope with it.

However, it is unclear what fraction of the population shows rumination and precise measures have not been established for ruminants. Therefore, the purpose of this research was to diagnose the proportion of the disabled and their oral conditions by conducting a large scale survey of people with rumination.

Objective and Method

This research was conducted with the approval of the ethics committee of the Dentistry Faculty, Meikai University (approval number: A1524). 27,661 males and 18,277 females, total 45,938 people of the 789 facilities (recovery rate 43.0%) from which responses were received from January to February of 2017 by sending questionnaires on rumination to 258 national child disability facilities and 1671 national disability facilities (total 1929 facilities) from the "List of Japanese Intellectual Disability Relevant Facilities and Offices, 2015".

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With the permission of the head of the facility and the guardian, the questionnaire was completed by the caregiver living in the facility. The question items were the number of residents, the number of officials and the number of ruminants among them, and if there were ruminants, their age, sex, degree of disability, degree of daily life, degree of rumination and oral condition.

Results

1. Number of ruminants

There were 753 Ruminants (1.6%) (605 males, 2.2%, 148 females, 0.8%) among the total 45,938 subjects.

2. Age distribution of ruminants (Figure 1)

In the age distribution of 725 people, the most was 231 (31.8%) in their 40's and next 148 (20.4%) in their 30's.

3. Age at which rumination began

The age at which the rumination began was unknown in 549 (75.6%), and in 175 who had an answer of an approximate age, 81 were the most frequent among 4 to 12 years old. 549 people (75.6%) did not know the age at which the rumination began and 81 among the 175 people who had an answer of approximate age were in the 4 to 12 year age group.

4. Types of disability (multiple answers) (Figure 2)

There were 620 with mental retardation (53%) and 368 with autism (31%) in the main type of disability.

5. About daily life (multiple answers) (Figure 3)

Of those with rumination, ① 560 people (38.8%) are able to feed themselves, ② 300 people (20.7%) eat according to instructions, ③ 235 people (15.8%) have some ability to communicate, ④ 151 people (10.9%) show some evidence of tooth brushing, ⑤ 94 people (6.1%) can talk, ⑥ 100 people (7.0%) could not be classified.

6. The time that rumination occurs (multiple answers) (Figure 4)

Rumination began: ① 407 people (47%) immediately after eating, ② 248 people (31%) 20 ~ 30 minutes after eating, ③ 160 people (20%) ruminated at any time.

7. Oral condition (multiple answers) (Figure 5)

The oral condition for: ① 261 people (25%) was usually a dirty mouth, ② 201 people (20%) had eroded teeth, ③ 183 people (18%) had extensive caries, 141 people (14%) had strong halitosis, while 237 people (23%) did not show the above symptoms.

Considerations

1. Large scale survey on the number of people with Rumination

Regarding the number of people with rumination, there have been a few reports [6,7] but in small populations, targeting the intellectually disabled. However, this survey of 45938 people in 789 facilities (43%) has shown that the number of people with rumination was 753 (1.64%).

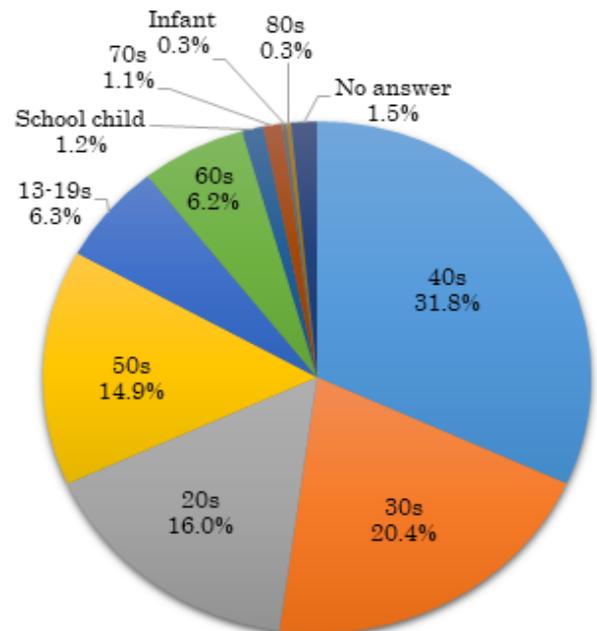


Figure 1. Age distribution.

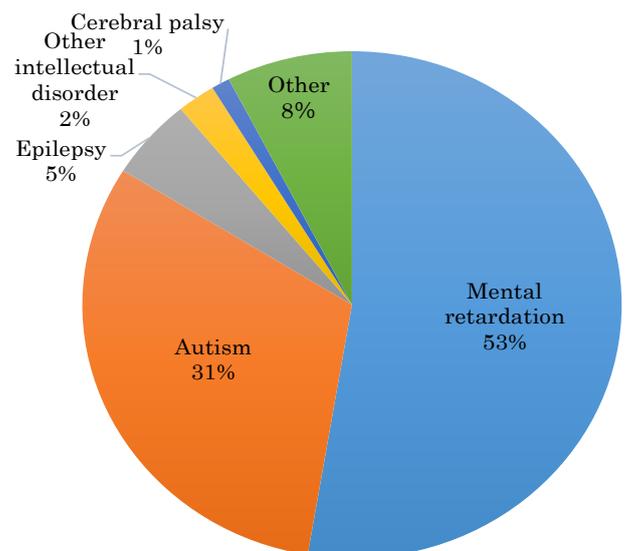


Figure 2. Disease type (Multiple answers allowed).

Based on this ratio, if we simply calculate the number of Japanese people with intellectual disabilities, there are about 740,000 according to the White Paper on the Disabled (Cabinet Office) in 2016 [9], it was estimated that about 12,000 ruminants are present in the Japanese people with intellectual disability.

The ruminants were mostly men and their age was mostly in their 40's and 30's, but this is proportional to the male / female ratio and the age distribution [9] of people with an intellectual disability and cannot be considered to be a specific value. Most disabilities (about 85%) were mental retardation including autism. The degree of rumination varied from person to person, and there were many people doing this immediately after eating or about 30 minutes after eating.

The oral condition of the people with rumination was consistent with past reports [8] that they have much dental caries, a dirty mouth, strong bad breath and significant tooth erosion, although about 35% of caregivers did not recognize any of these symptoms.

2. Literature consideration on general rumination

① Mechanism that causes rumination

There is a report [10] that the rumination seen in autism, the intellectually disabled, schizophrenia, dementia, etc. appears as self-stimulating behaviors such as self-injury, sense

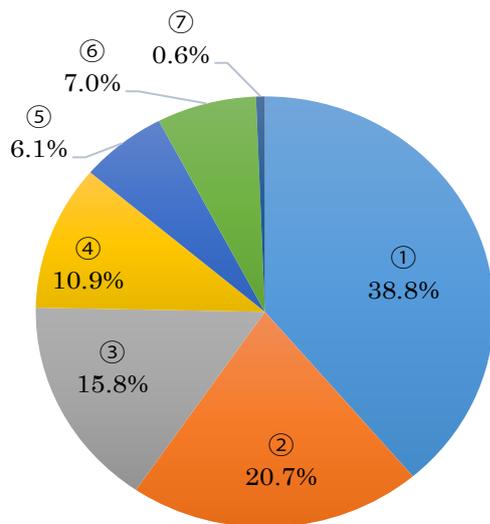


Figure 3. Degree of daily life (Multiple answers allowed).

- ① No need for meal assistance
- ② Understand instructions
- ③ Communication is possible
- ④ No need for teeth brush
- ⑤ Conversation is possible
- ⑥ It is neither 1 nor 5
- ⑦ No answer

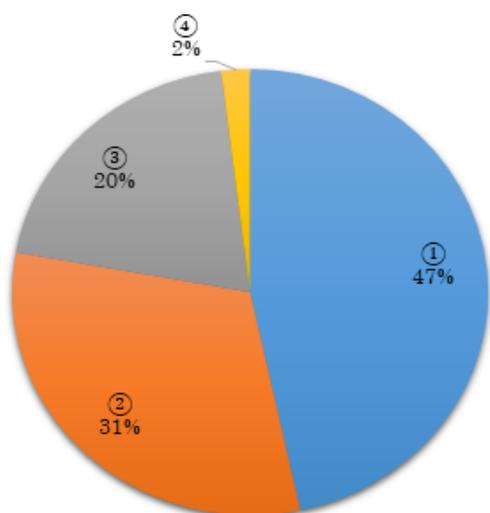


Figure 4. Timing of rumination (Multiple answers allowed).

- ① Immediately after meals
- ② 20 to 30 minutes after meals
- ③ At any time
- ④ Other

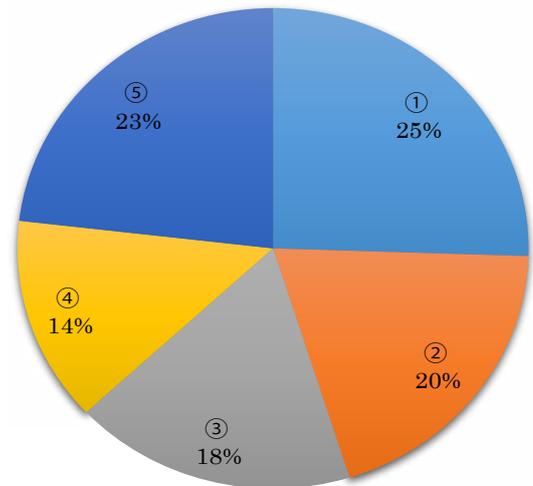


Figure 5. Intraoral condition (Multiple answers allowed).

- ① Always dirty
- ② Many abrasive teeth
- ③ Many caries
- ④ Bad breath
- ⑤ Other

play, stereotyped acts. Self-stimulating behavior is said to be a behavior that balances protecting oneself against a panic condition, sensory paralysis, sensory hypersensitivity, etc., or when communication is difficult and they do not know how to cope. One type of specific behavior that appears at that time is cited as rumination with vomiting, of a pica, spitting, etc. [10].

The mechanism of neurotransmission involved in vomiting has not yet been clarified in people who ruminate. Peristaltic movement takes place from the pyloric part of the stomach to the cardia part before rumination occurs, and the stomach contents are pushed up from the bottom of the stomach. As for the vomiting, there is a report [11] that the pressure spike of the abdomen increases without the compression (contraction) of the upper gastrointestinal region, so that it is performed easily without "convulsions" such as vomiting.

② Secondary disease caused by rumination

Apart from oral and stomach diseases, inflammation of the stomach, esophageal part, etc. can be mentioned. It has been reported that gastroesophageal abnormality was observed in 91% of people who ruminate, as judged by other research using gastrointestinal endoscopy reported that 50% of the participants appeared to have esophageal reflux disease and esophagitis [13]. For the intellectually disabled, it is considered that rumination is often overlooked because it is difficult to diagnose.

③ Treatment of and response to rumination

No treatment has been established that will completely stop rumination. Drug treatment with opioid preparations [14] was also attempted, but no beneficial effect has been shown. Therefore, there is currently only a voluntary behavioral therapy that may be accepted in daily life without compulsion and an ineffective drug response [15,16]. If it is not possible to eliminate rumination completely, it is desirable to take measures to raise the level and frequency of oral care. It may be preferable not to clean the mouth after each meal, but clean several times after the time of rumination.

Conclusion

It was shown that the number of the disabled who experience rumination is relatively large. For the disabled, it is desirable to add rumination to the categories of disease, such as eating dysphagia, rather than identifying it as a problem simply of courtesy or a life custom.

In addition, it seems necessary to prepare guidelines on deciding and implementing a response that is appropriate for the individual by carrying out the necessary diagnosis and inspection.

There are no companies or organizations in the COI relationship that should be disclosed in relation to this report.

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