MATERNAL BEHAVIOUR ON GOLDEN HAMSTER (*MESOCRICETUS AURATUS*)

ILEANA NICHITA[1], MONICA ŞEREŞ[1], C. COMAN[2]

[1]Faculty of Veterinary Medicine Timisoara, 300645, Calea Aradului No. 119, Timisoara, Romania
[2]NIRDMI Cantacuzino
E-mail: nichita_ileana@yahoo.com

Summary

In ten female golden hamster (*Mesocricetus auratus*), rearing first litters, the maternal activities were study during the observation period (21 days from parturition) divided into two stages: (2 – 10 days and 11 – 21 days). The following females activities were recorded: the frequency of pup grooming (both body and anogenital licking were included), frequency of pup nursing (crouched arch posture over pups), frequency of bringing of food into the nest and frequency of the nest building activity (bringing wood shaving for bedding into the nest and manipulation of bedding material inside the nest. The female under this study displayed a considerable maternal care in the first rearing stage when the pups are very vulnerably and less care in the last rearing stage when the time of weaning is nearest

Female displayed all the patterns of direct care of young including nursing and pups grooming.

Key words: gold hamster, maternal care

The high maternal investment in young characterized the reproduction in mammals (1). In small rodents with altricial pups, immediately upon appearance of the first born, parturient female rodents display a full complement of maternal behaviors, such as pup retrieval, grooming and crouching over the pups. (3). In some rodent species the timidity prevents the virgin female from being a good mother and this is one of the facts for pups killing (2, 5).

In this study few aspects of maternal behavior in golden hamster (*Mesocricetus auratus*) were monitorised in order to further our knowledge about parental care among cricetid rodents.

Materials and methods

Animals used in this study were laboratory bred descendants of the golden hamster (*Mesocricetus auratus*). Observation were done on 10 females that rearing their first litter.

For the good observation during the study each pregnant female were transferred from their cages in to 40 x 30 x 35 cm glass aquarium with wood shaving as bedding. The aquariums were placed in a quiet room with natural

illumination (16 L and 8D). During the study the female received the same food as before birth consisted in oats and sunflower seeds and fresh vegetable (carrot, apples and cabbage). Animals were feed and watered *ad lib* but the food was refreshed twice a day. The observation period was chosen up to 21 day after parturition. Because it is know that the time of peak activity in this species is the period from 19:00 to 24:00, the observation were done for two hours within 20:00 and 22:00. During the observation period the test aquarium was additionally illuminated with 40 W electric lamp attached at 1 m above. The following females activities were recorded: duration of pup grooming (both body and anogenital licking were included), frequency of pup nursing (crouched arch posture over pups), frequency of bringing of food into the nest and frequency of the nest building activity (bringing wood shaving for bedding into the nest and manipulation of bedding material inside the nest.

Data collections were grouped into two periods (stages) in dependence on age of pups: days 2 – 10 (when the pups open the eyes) and days 11 – 21. Data were statistical calculated. An average value of each parameter was calculated from the two observation sessions to obtain a mean value of the parameter for each rearing period for each female and its activities.

Results and discussions

The obtained results from the study done on behavior of hamster female that rearing their first litter are presented in the table 1.

Comparatively between the first and the second observation period there are maternal activities as the of bringing wood shaving from nest bedding, the manipulation movements of the bedding material and nursing that express much higher in all of the monitored hamster female. The activity of bringing food in the nest has the same frequency on both period of observation.

The nest building activity (bringing wood shaving for bedding into the nest and manipulation with bedding material inside the nest) was highest in the first observation period, especially in the six days before parturition. After that these activity was low and irregular. The average number of the movement for bringing wood shaving in the nest (fig. 1) was 5.94± 2.10 per one hour (lim. 2 and 9) in the first observation period and 1.78±1.13 per one hour (lim. 1 and 6) in last observation period.

Table 1

Frequency of monitored behavior activities of hamster female that rearing their first litter

Day of observation	Behavior activity (number of movements per one hour)				
	Bringing wood shaving for bedding into the nest	Manipulation movements of the bedding material	Bringing food in the nest	Nursing frequency	Pup grooming
2	6.7±1.41	18.8±2.20	7.5±1.17	51.3±5.96	122.7±39.65
4	6.9±1.66	21.3±2.71	6.9±1.59	49.2±4.68	127.3±42.7
6	7.2±1.31	21±3.46	6±1.15	43.5±5.64	102.0±43.32
8	4.6±1.83	18.2±4.84	6.7±1.20	35.7±8.16	98.04±32.12
10	4.3±1.88	16±2.78	6.9±1.19	32±8.41	80.0±29.87
$\bar{x} \pm S\bar{x}$	**5.9±2.10**	**19.1±3.74**	**6.8±1.31**	**42.3±9.93**	**115.0±29.8**
12	2.9±1.79	13.9±2.68	6.3±1.56	22.9±4.06	65.3±23.65
14	2.1±0.73	10.6±2.71	5.9±1.91	16.9±3.95	49.3±21.44
16	1.4±0.69	8.8±1.81	6.3±1.33	13.2±4.15	32.5±12.09
18	1.2±0.42	7.2±3.39	5.5±1.08	7.6±3.30	16.6±6.75
21	1.3±0.48	5.2±2.29	4.6±1.17	5.4±2.63	12.6±6.30
$\bar{x} \pm S\bar{x}$	**1.7±1.13**	**9.1±3.92**	**5.7±1.52**	**13.2±7.29**	**38±24.78**

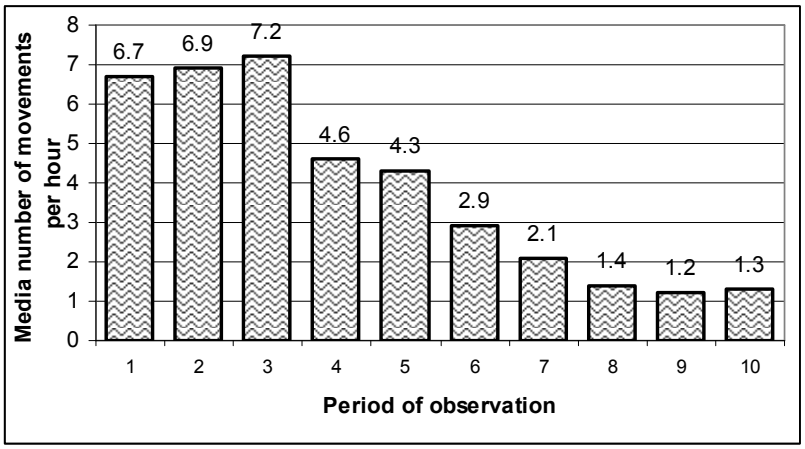

Fig. 1. Frequency of bringing wood shaving into the nest

The frequency of manipulation movements of the bedding material inside the nest (fig. 2) was in average 19.1±3.74 per 1 hour (lim. 12 and 29), significantly decreased in the last days of the observation period (9.14±3.92 with lim. 3 and17)

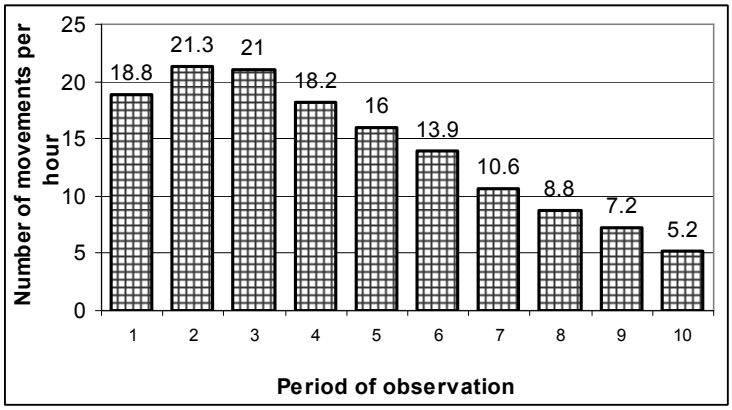

Fig. 2. The frequency of manipulation movement of bedding material inside the nest

The frequency of bringing food into the nest was quite similar in both period of the study as could be seen in picture no 3. The average frequency of these activities was 6.8±1.31 (lim. 5 and 10) per one hour, in the first period and 5.72±1.52 (lim. 3 and 9) per one hour in the second period.

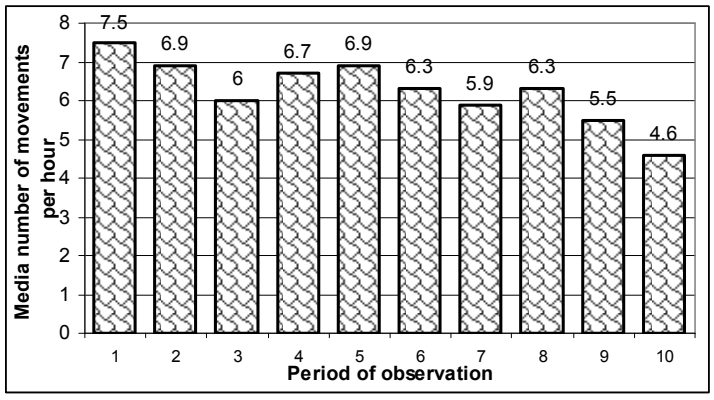

Fig. 3. The frequency of bringing food in the nest

The medium value of the nursing frequency (crouched arch posture over pups) was clearly higher in the first period of observation (2 -10 days). It was 3.2

higher in the first observation period than in the second period, as could be see from the picture no 4 The average frequency of nursing was 42.34 ± 9.93 per one hour (lim. 22 – 59) in the first period of these study comparatively with an average of 13.2 ± 7.29 per hour (lim. 2 - 28) in the second period.

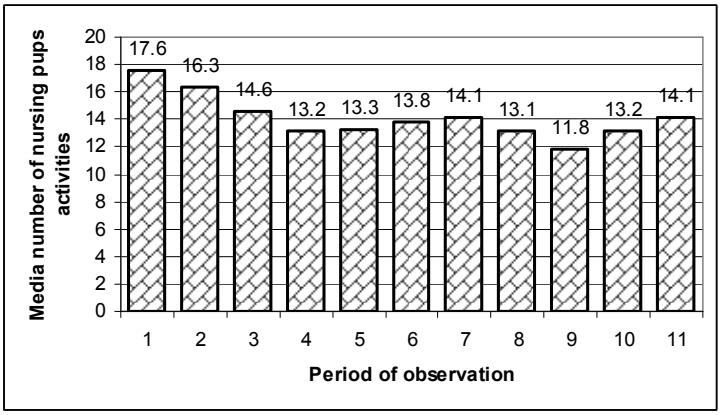

Fig. 4. The frequency of nursing pups activities

The frequency of pups grooming is presented in picture no 5. In the first observation period the frequency of pup grooming was significantly greater (in average, 115 ± 29.8 per hour, lim. 45 and 163, than in the second period (in average 38 ± 24.7 per hour, lim. 7 – 108.). Female spent less time grooming the pups in the end of the observation period (in average 38 ± 24.7 per 1 hour).

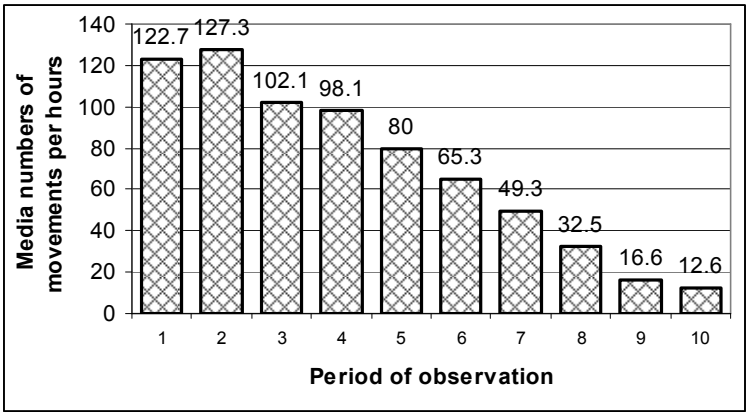

Fig. 5 The frequency of pups grooming

A high degree of concordance was found between the results obtained in this study and the study realized by the *Gromor*ov et al. (4) that studied the maternal behavior of the grey hamster *Cricetullus migrator*ius. This study revealed that the observed golden hamster female displayed little mate during the last rearing stage when the time of weaning is coming. Because others studies in hamster behavior used different experimental conditions and behavior monitoring methods it is difficult to carry out a correct comparisons among cricetid rodents (3, 5, 6).

Conclusions

The female under this study displayed a considerable maternal care in the first rearing stage when the pups are very vulnerably and less care in the last rearing stage when the time of weaning is nearest

Female displayed all the patterns of direct care of young including nursing and pups grooming.

In terms of maternal care, the female of golden hamster exhibited behavioral trends similar to those of other cricetid rodents

References

1. **Clutton-Brock, T.H.**, The Evolution of Parental Care, Princeton University Press, Princeton, 1991.
2. **Champagne, F.A., Francis, D.D., Mar, A., Meaney, M.J.**, Variations in maternal care in the rat as a mediating influence for the effects of environment on development, Physiol Behav, 2003, 79, 359–71.
3. **Daly, M.**, The maternal behavior cycle in golden hamster (*Mesocricetus auratus*). Zeitschrift fur Tierpsychologie, 1972, 31, 3, 289-299.
4. **Gromorov, V.G., Surov, V.A., Ryurikov, B.G.**, maternal care in captive hamster Cricetullus migratorius (Rodenti, Cricetidae), Russian J. Theriol., 2006, 5 (2), 73-77.
5. **Potegal, M., Popken, J.**, The time course of attack priming effects in female golden hamsters. Behav. Processes, 1985, 11, 199-208.
6. **Richards, M.P.M.**, Maternal behavior in virgin golden hamster (*Mesocricetus auratus*) - the role of the age of the test pup, Animal Behavior, 1966, 14, 3, 303 -309.