

УДК 612.08

COMPARING ROUND AND SQUARE OPEN FIELD TEST ARENAS

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Open Field test is one of the most popular and well-known animal behavioral tests. It has been invented in 1932 by Calvin Hall, and since then, is widely used to study animal emotionality. The test is based on the animals' natural tendency to explore new territory: the exploratory activity differs in animals with different emotional rate. Rats and mice are the most popular organisms to test in Open Field, but there are works studying voles, gerbils, hamsters, dogs and even human babies at 10 months age. «Open Field» is included to the list of obligatory research methods for anxiolytic drugs pre-clinical testing, it is also used in studies of animal models of depression and effects of environmental factors (such as noise, etc.) on the nervous system.

Several modifications of test apparatus are used, such as round and square arenas. Round and square arenas are believed to be equal, but we haven't found any works proving this. It is known that rats and other rodents have a tendency to hide in enclosed places, such as edges. So, the question is if presence or absence of edges in the arena could influence test results. That's why in our work we aimed to compare two modifications of Open Field test apparatus: with round and square arenas.

In our study we used 2 arenas of equal area: a square and a round one. Other test conditions were equal too. We tested 10 adult Wistar rats: 5 males and 5 females. In each testing series, animals were successively put in a square arena for 3 minutes, its behavior filmed with the video camera. When all rats were tested in square arena, the whole procedure was repeated for the round one.

We conducted 3 test series with 7 days interval to study the possible difference in adaptation to the novel environment (time dynamics of the parameters).

Statistically significant (at $p < 0.05$) differences were found only in the inner horizontal activity rate and in the time dynamics of hole reflex. So, inner horizontal activity was a little higher in round arena (rats were more likely to enter the central segments of the arena). As for hole reflex parameter, in the first test series it was significantly higher in the square arena, then rapidly decreased in the second series, and increased once more in the 3rd. In round arena, the dynamics was diametrically opposite.

In other parameters (freezing frequency and latency, outer horizontal activity, vertical activity, long and short grooming, defecation), no significant differences were found.

As hole reflex and inner horizontal activity are not considered to be crucial parameters in Open Field test and are even ignored in some works, we can say that results obtained in both arenas are nearly equal. So, we can make a conclusion that these two modifications of Open Field can be used equally.