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# *The Influence Of Murottal Al-Quran Exposure To Leydig Cell Of Stressed Male Mice (Mus musculus)*

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***Keyword :***
*Stress,*
*Noice,*
*Murottal Al-Quran,*
*Surah Ar-Rahman,*
*Leydig Cell*

***A b s t r a c t***

***Introduction:*** *Stress is a body's response experienced by a person due to burdened feelings or oppressed in a particular event. Stress may interfere body's homeostasis. One of them is the spermatogenesis process. Healthy stress management is necessary, for example, by doing murottal Al-Qur'an. Reading Al-Qur'an with tartil delivers a beautiful tone and has a relaxing effect and stress release.* ***Objectives:*** *This research aims to determine the effect of murottal Al-Qur'an on the amount of Leydig cells on male mice (Mus musculus) who are experiencing stress.* ***Methods****: The compressor used is noise from the road with an intensity of> 85dB, given for 12 hours (18.00-06.00) for 21 days. The therapy used was murottal Al-Quran surah Ar-Rahman verses 1-78, which read by Shaykh Abdurrahman Sudais. In this research there were five categories, they are K+ (not given the stressor and murottal therapy), K- (given noise stressors and not given murottal therapy), P1 (given noise stressors for 12-hours and murottal therapy for 1-hour), P2 (given noise stressor for 12-hours and murottal therapy for 2-hours), P3 (given a stress stressor for 12-hours and murottal therapy for 4-hours). Moreover, observations were done on testicular histology preparations with Hematoxylin Eosin staining in olyvia (c) applications. The number of Leydig cells was examined with a 40x magnification microscope. Cell calculations are done manually with the image raster application.* ***Results:*** *The Result from this study were analyzed with normality and homogeneity tests followed by the analysis of variance (ANOVA) and least significant difference test. The differences were considered significant when p <0.05.* ***Conclusions:*** *Lastly, it can be concluded that there is an influence of murottal Al-Quran on the number of Leydig cells in male mice under stress*

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## INTRODUCTION

The WHO data in 2015 stated that the prevalence of deaths due to stress reached 38 million people annually (1). Stress is a physiological and psychological response to the body that can interfere with the body's homeostasis and cause hormonal changes in the body. One of the effects of stress is that it can reduce male reproductive function. Stress affects the secretion of hormone in the Hypothalamus Pituitary Adrenal (HPA), then the HPA releases corticotropin-releasing hormone (CRH). CRH will stimulate the pituitary gland to secrete the adrenocorticotropin hormone (ACTH). The removal of ACTH will trigger the adrenal gland cortex to secrete glucocorticoids, primarily cortisol. Excessive cortisol production will inhibit gonadotropin-releasing hormone (GnRH), thereby affecting the secretion of Luteinizing Hormone (LH) and Follicle Stimulating Hormone (FSH) (2). The FSH stimulates the Sertoli cells to produce Androgen-Binding Protein (ABP). Then, it stimulates spermatogonium to start spermatogenesis. If

it inhibited, the spermatocyte cells would also be reduced. The function of LH is to produce testosterone under the influence of Leydig cells. Leydig cell activity is strongly influenced by gonadotropin levels, especially LH / ICSH. If gonadotropin is disrupted, then Leydig cells will be disrupted (3). If the excretion of gonadotropins is disrupted, apoptosis will occur in the Leydig cells produced by the LH, reducing the production of testosterone. Obstacles at one stage of the spermatogenesis process will affect the next stage.

Al-Quran has beautiful tones when recited with murottal will be able to bring calm and minimize anxiety 97% for those who hear it, and 65% calm from reading it (4). When someone listens to the Al-Quran murottal, it will stimulate delta waves of 63.11 Hz in the frontal and central areas on the right and left side of the brain. It caused the sound produced by Al-Quran murottal to reduce stress by activating the natural endorphins that can cause the listener to be calm, quiet, comfortable, and peaceful (5). When the situation is relaxed, the excretion of cortisol hormone will be reduced by the body, a decrease in the cortisol hormone will cause the function of GnRH to release FSH and LH. If LH production increases, it will activate Leydig cells to produce more testosterone, so that the process of spermatogenesis can run well.

## RESEARCH METHODS

### Time and Place of Research

The time of this research was from January - March 2020. The experimental animals' treatment was treated in the laboratory of experimental animals in the Pharmacy Departmen, Faculty of Medicine and Health Sciences, State Islamic Univercity of Maulana Malik Ibrahim Malang. Testicular histological preparations and Leydig cell observations were carried out in the Pathology and Anatomy Laboratory, Faculty of Medicine, Brawijaya University Malang.

### Tools and Materials

The tools used in this study were scissors, mouse cages, eating places, drinking places, surgical boards, surgical scissors, tweezers, sound level meters, Polytron speakers, timers, vials, microtomes, Olympus microscope, glass objects, cutters, hand counters.

The materials used in this research were chloroform 70%, alcohol 70%, Formalin 10%, xylol, eosin coloring, water ammonia, harris hematoxylin was purchased at Pathology and Anatomy Laboratory, Faculty Medicine, Brawijaya University Malang. Mice testicles was buught at Biology Departmen Faculty Science and Technology State Islamic University of Maulana Malik Ibrahim Malang.

### Research Samples

The experimental animals used were 30 mice (Mus musculus), which were divided into five treatment groups. Mice used are male Balb / C strain with a bodyweight of 20-30 grams, ages 3-4 months, and mice in good health without defects. The animal was acclimatized for one week before entering the treatment stage. After acclimatization, the sampling technique is carried out.

The sampling technique used in this research is simple random sampling technique. Randomization was done by giving a number label on the cage then randomly taken to include mice into 5 treatment groups of 6 mice per group.

### Research design

This research is an experimental laboratory study using a true experimental design post-test only control group design. In this study, there were five treatment groups namely K + (Not given noise stressor and not given murottal therapy), K- (Given noise stressors for 12 hours and not given murottal therapy), P1 (Given noise stressors for 12 hours and murottal therapy for 1 hour), P2 (Given noise stressor for 12 hours and murottal therapy for 2 hours), P3 (Given

noise stressor for 12 hours and murottal therapy for 4 hours).

**Treatment of Test Animals**

Positive control group (K+) mice were placed in different rooms with negative control groups (K-) and treatment groups (P1, P2, P3). The negative control group (K-) and the treatment group (P1, P2, P3) were played by street noise stressors through speakers for 12 hours (18.00-06.00) for 21 days with sound intensity >85dB as measured by the sound level meter. After giving noise stressors, in the treatment group (P1, P2, P3) murottal was played for (1,2,4) hours, the *surah* being played was Ar-Rahman verse 1-78 which was read by Qori 'Abdul Rahman As-Sudais with sound intensity <60dB as measured by a sound level meter for 21 days.

**Testicle Sampling**

After 21 days of treatment, on the 22nd day, the termination was carried out. Termination is done by anesthesia using chloroform. The next step was surgery by cutting the abdomen laterally and midsagittal to get the left testicular organ. The testicles that have been taken are washed first with 0.9% NaCl to clean them of the blood and preserved using formalin 10%. so as not to damage or rot. The next step is to make testicular histological slide with Hematoxylin Eosin (HE) staining.

**Observation of Leydig Cell Number**

The observation of cell used the Olympus SN 3K19322 AC Volt I light microscope with magnification 400 times. The observations in the form of images were observed with Olyvia Software and cell calculations using Image Raster 3.0. Leydig cell were calculated in 10 different fields of 3-5 seminiferous tubules with 400 times magnification.

**Data Analysis**

The data from this study were analyzed with normality and homogeneity tests followed by the analysis of variance (ANOVA) and least significant difference test. The differences were considered significant when $p$ <0.05

**RESULTS AND DISCUSSION**

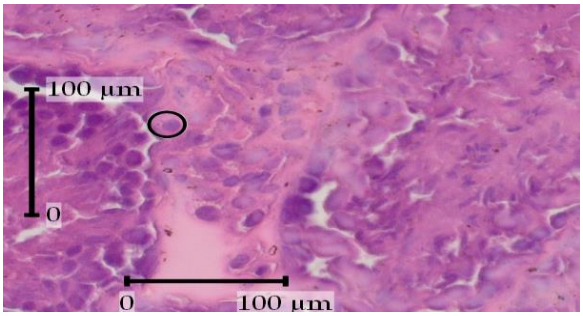


**Figure 1. Black circle: Leydig cells**

**Table 1. Leydig Cell Calculation Table**

| Mice / Group | Leydig cell number | | | | | Mean±S |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| **K+** | 87 | 40 | 99 | 159 | 114 | 64 ± 16.077 |
| **K-** | 54 | 68 | 74 | 83 | 149 | 77.6 ± 27.373 |
| **P1** | 48 | 105 | 81 | 101 | 147 | 81.2 ± 11.410 |
| **P2** | 57 | 104 | 69 | 115 | 112 | 116.4 ± 28.404 |
| **P3** | 74 | 71 | 83 | 124 | 162 | 136.8 ± 22.487 |

**Leydig Cell Calculation Result**

The result showed that mice with Al-Quran murrotal therapy had higher Leydig cell counts than mice that were not given Al-Quran murrotal therapy (only even noise stressors). In the negative control group (K-) that given stress noise, the average cell count was 77.6. The difference was seen in the administration of murrotal in the treatment groups 1, 2, and 3 given murrotal Al-Quran as stress therapy. The first treatment had an average number of Leydig

cells, which was 81.2, the second treatment had an average number of Leydig cells 117.6, while the third treatment had an average number of Leydig cell 136.8.

Based on the calculation result, it can be seen that the highest number of Leydig cells was in the third treatment (P3).

**Statistical Data Analysis Result**

In this research, after Leydig cell calculations were performed, statistical data is performed. The result of the normality test in this research has a significance value> 0.0, so it can be stated that the data o the number of Leydig cells in this research spread out following the normal distribution. Then the Homogeneity test was performed, and a value of 0.329 was obtained, which means data of the treatment group on Leydig cell variables in this research had homogenous variations. Furthermore, *one way*-ANOVA test was done, and a significance value of 0,000 was obtained, which means that the data was significant, or there is a murrotal effect on the number of Leydig cells. The last, LSD test was conducted to find out the differences between each treatment group.

The LSD test results show that the positive control group (K +) did not differ significantly from the negative control group (K-) and (P1). Still, it was significantly different from the treatment groups P2 and P3. The negative control group (K-) did not differ significantly from the positive control group (+) and P1, and it was significantly different from the P2 and P3 groups. The group 1 treatment (P1) was not significantly different from the positive control group (K +) and negative control (K-), but it was significantly different from the P2 and P3 groups. The group 2 treatment (P2) did not differ significantly from treatment 3 (P3), but P2 was significantly different from the positive control group (K +), negative control (K-), and the group 1 treatment (P1). The group 3 treatment (P3) did not differ significantly from treatment group 2 (P2), but it was significantly different from the positive control group (K +), negative control (K-), treatment 1 (P1) and treatment 2 (P2).

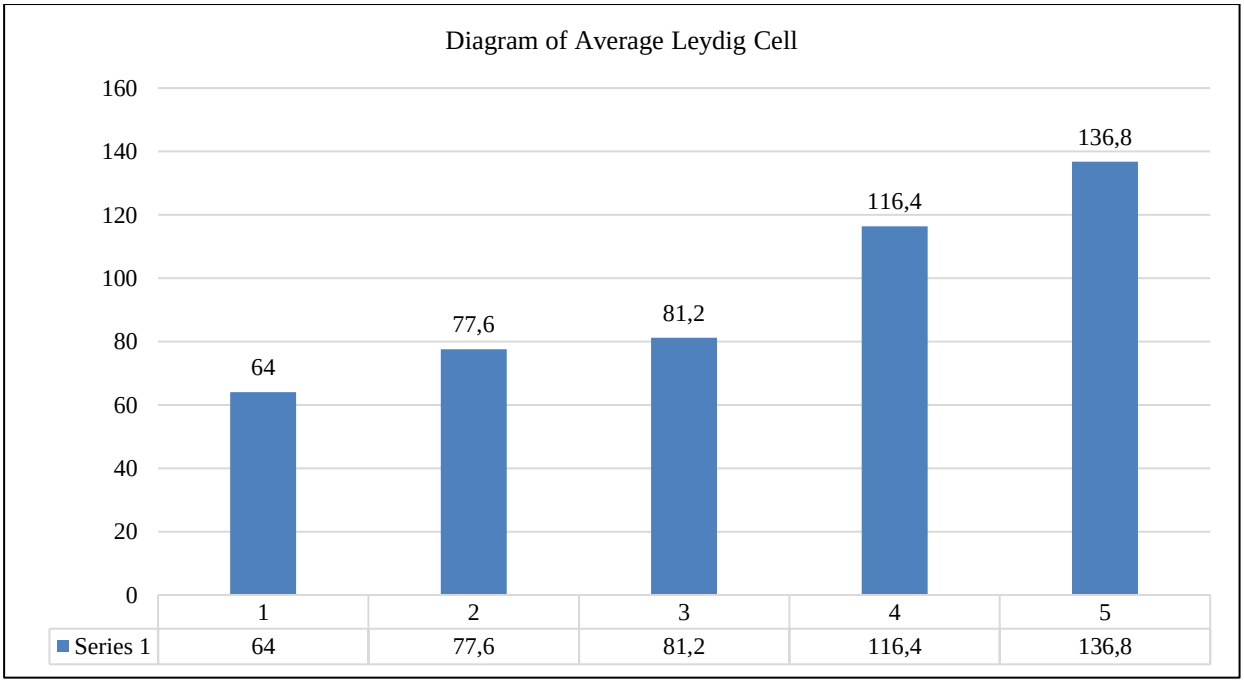


**Figure 2. Effect of Murrotal on Leydig Cells**

There were a differences between the number of Leydig cells in the negative control group and murrotal therapy. It means that there was an increase in the number of Leydig cells if the Leydig cells increased so that spermatogenesis went well.

When someone listens to the murrotal Al-Quran, it will stimulate delta waves of 63.11 Hz in the frontal and central areas. It caused the sound produced by murrotal Al-Quran can reduce stress by activating the natural endorphins that can cause the listener in a calm, peaceful, comfortable, and peaceful state (Wahida, 2015). This research aims to determine the murrotal effect on male mice (*Mus musculus*) Leydig cells experiencing stress. The *oneway-A*NOVA test was performed (p-value = 0.000) significantly, which means that murrotal Al-Quran therapy affects the number of Leydig cells in male mice under stress.

The statistical analysis result of the *oneway-ANOVA* test showed a significant difference (p>0.05), then the LSD test was performed to determine the significance of the differences between groups. The LSD test was not significantly different in the K+ group from the K- and P1 groups, but significantly different from the P2 and P3 groups. The K-group did not differ significantly from the positive (+) and P1 control groups and significantly different from the P2 and P3 groups. The number of Leydig cells was not significantly difference between the positive and negative control group. It's because the mice also experience stress, due to exposure to other sources of noise in the location placement. The Group P1 (1-hour therapy) is not significantly different from the positive control group and negative control and significantly different from P2 and P3 groups allegedly because the duration of therapy is not long enough, based on research by Kurniasari (2017) which states that murottal Al-Quran therapy for 2 hours can reduce stress on pregnant mice.

The P2 group was not significantly different from the P3 group, but it was significantly different from the K +, K- and P1 groups. P3 group was not significantly different from P2 group and significantly different from K +, K- and P1 groups. The significant differences between groups P2 and P3 indicate that the murottal of the Quran given can influence the number of Leydig cells in stressed mice that is marked by the significance between the number of cells.

In this research, it is estimated that when there is murottal Al-Quran exposure, there is an increase in endorphins so that there is a decrease in anxiety and the emergence of feelings of peace and calm, it is following the results of research showing sound able to regulate hormones that affect a person's stress (6), besides Varadaraj's research in 1992 stated that the administration of beta-endorphin hormone for three days in adult mice was able to modulate steroidogenesis in adult mice, resulting in an increase in testosterone. Dr. Al Qadhi in Gusmiran (2005), in his research in Florida, the United States also proves that listening to murottal a Muslim can feel physiological changes (reduced nervous tension).

Based on the description above, it can be seen that there are murottal AL-Quran to the number of male Leydig cells that are experiencing stress, so that murottal therapy can be used as therapy or additional therapy in dealing with stress.

## CONCLUSION

Based on the results of this research, there is the influence of murottal Al-Quran on the number of Leydig cells in male mice that are experiencing stress, and it is proven by the difference in the number of Leydig cells between the control group and the treatment group. P3 (Given noise stressor for 12 hours and murottal therapy for 4 hours) has the highest number of leydig cells than others (K+, K-, P1, and P2).

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