

# EVALUATION OF THE EFFECTS OF BIORESONANCE THERAPY AND MANUAL LYMPHATIC DRAINAGE ON IMMUNE INDICES IN CANINES

## KÖPEKLERDE BİYOREZONANS TERAPİ VE MANUEL LENFATİK DRENAJIN BAĞIŞIKLIK ENDEKSLERE ÜZERİNE ETKİSİNİN DEĞERLENDİRİLMESİ

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### Özet

**Amaç:** Bu çalışma, manuel lenfatik drenaj (MLD) sonrası köpeklerde quantum-pet-analysis biyorezonans teknolojisinin bağışıklık parametreleri üzerindeki etkilerini araştırmayı amaçlamaktadır. **Materyal ve Metot:** Çalışmaya, Aydın Adnan Menderes Üniversitesi Bağırsak Geçirgenliği Ölçüm Merkezi'ne dermatolojik değerlendirme için getirilen, 4 ile 11 yaş aralığında yedi sahipli köpek dahil edilmiştir. Her köpek, biyorezonans ölçümleri ve MLD tedavisini içeren öncesi-sonrası değerlendirmelere tabi tutulmuştur. Biyorezonans ölçümleri Quantum Pet Analiz cihazı ile gerçekleştirilmiş, MLD ise preskapular, popliteal ve mandibular lenf düğümlerini hedef alacak şekilde uygulanmıştır. Bağışıklık parametreleri, eşleştirilmiş t-testi veya Wilcoxon işaretli sıra testi kullanılarak analiz edilmiş, istatistiksel anlamlılık  $p < 0.05$  olarak belirlenmiştir. **Bulgular:** Tedavi sonrası Dalak İndeksi'nde istatistiksel olarak anlamlı bir artış ( $p = 0.031$ ) gözlemlenmiş, bu da splenik fonksiyon üzerinde ölçülebilir bir etkiyi göstermiştir. Ancak, Lenf Düğümü İndeksi, Tonsil İmmün İndeksi, Kemik İliği İndeksi ve Timüs İndeksi'nde anlamlı bir değişiklik saptanmamıştır ( $p > 0.05$ ). **Sonuç:** Elde edilen bulgular, biyorezonans terapisinin MLD ile kombinasyonunun köpeklerde özellikle splenik fonksiyon üzerinde seçici immünmodülatör etkiler gösterebileceğini düşündürmektedir. Biyorezonansın veteriner tıptaki terapötik potansiyelini ve klinik önemini daha iyi anlamak için daha geniş örneklem gruplarıyla ve moleküler analizleri içeren ileri çalışmalara ihtiyaç duyulmaktadır.

**Anahtar Kelimeler:** Biyorezonans, immün indeks, köpek, lenfatik drenaj

### Abstract

**Objective:** This study aimed to investigate the effects of quantum-pet-analysis bioresonance technology on immune parameters in dogs after manual lymphatic drainage (MLD). **Material and Method:** The study included seven owned dogs aged between 4 and 11 years, brought to Aydın Adnan Menderes University Intestinal Permeability Measurement Center for dermatological evaluation. Each dog underwent pre-post evaluations including bioresonance measurements and MLD treatment. Bioresonance measurements were performed with Quantum Pet Analyzer, and MLD was applied targeting prescapular, popliteal and mandibular lymph nodes. Immune parameters were analyzed using paired t-test or Wilcoxon signed rank test, statistical significance was determined as  $p < 0.05$ . **Results:** A statistically significant increase ( $p = 0.031$ ) in Spleen Index was observed after treatment, indicating a measurable effect on splenic function. However, no significant change was detected in Lymph Node Index, Tonsil Immune Index, Bone Marrow Index and Thymus Index ( $p > 0.05$ ). **Conclusion:** The obtained findings suggest that the combination of bioresonance therapy with MLD may have selective immunomodulatory effects especially on splenic function in dogs. Further studies with larger sample groups and molecular analyses are needed to better understand the therapeutic potential and clinical importance of bioresonance in veterinary medicine.

**Keywords:** Bioresonance, dog, immune index, lymphatic drainage

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## 1. INTRODUCTION

Massage therapy is among the oldest documented therapeutic techniques, with historical records dating back to 2500 BC. Initially practiced in ancient China, it was later adopted by Greek, Indian, and Roman civilizations. Hippocrates described it as "the art of rubbing," particularly for musculoskeletal injuries, which contributed to its widespread use during the Roman Empire (Mcsp, 1994; Celsi, 1965). While its medical application declined during the Middle Ages, the publication of *Du Massage* in 1863 redefined its classification and standardization, laying the foundation for modern massage therapy (Estradere, 1863)

In veterinary medicine, massage therapy is frequently employed as an adjunctive treatment. Among its specialized forms, manual lymphatic drainage (MLD) is a therapeutic technique designed to facilitate lymphatic circulation through gentle, superficial gliding motions (Figure 1). Lymphedema, resulting from interstitial fluid accumulation, impairs drainage and can lead to secondary complications. MLD has been widely utilized in small animals and horses, often in combination with compressive bandaging to optimize its therapeutic effects (Affolter, 2013; Wittlinger et al., 2011). Clinically, MLD is primarily indicated in postoperative orthopedic care, particularly in managing stifle edema following cranial cruciate ligament repair via osteotomy, as well as in reducing mastectomy-related limb edema in both veterinary and human patients (Ezzo et al., 2015). Moreover, it remains one of the few available treatments for primary (congenital) lymphedema, a rare condition observed in dogs and cats (Jacobsen ve Eggers, 1997).

Bioresonance therapy, initially introduced by Franz Morell and Erich Rasche in the 1970s, was developed as a diagnostic modality within the framework of electroacupuncture (Pihtili et al., 2014). This technology operates on the principle that pathological conditions induce disruptions in the body's natural electromagnetic oscillations. Using specialized bioresonance diagnostic systems, it is possible to detect and modulate these frequencies, thereby restoring physiological homeostasis (Foletti et al., 2013; Montenegro et al., 2006). Spectral analysis of an organism's electromagnetic field allows for differentiation between normal and abnormal frequencies, potentially facilitating early disease detection (Barbault et al., 2009). Initially applied in human medicine, bioresonance therapy was later expanded to veterinary applications, particularly in the modulation of immune responses (Lambeck, 2007). Given its influence on epigenetic mechanisms and chromatin remodeling, bioresonance therapy may regulate key biochemical pathways involved in both disease progression and immune modulation (Mehdipour et al., 2015).

Despite its expanding use, there remains limited scientific validation regarding the effects of bioresonance therapy on immunological parameters in veterinary medicine. Furthermore, no studies to date have examined its interaction with manual lymphatic drainage in canine models, despite the theoretical potential for synergistic physiological effects.

This study aims to investigate the effects of quantum-pet-analysis bioresonance technology on immune parameters in dogs following manual lymphatic drainage. By assessing bioresonance-induced immunomodulatory changes, this research seeks to contribute to the understanding of its potential diagnostic and therapeutic applications in veterinary medicine.



**Figure 1.** Application of MLD to mandibular, popliteal and prescapular lymph nodes in a dog included in the study.

## **2. MATERIAL AND METHODS**

### **2.1. Animal Selection**

This study was conducted on canine patients presented to the Intestinal Permeability Measurement Center (IPOM), affiliated with the Faculty of Veterinary Medicine, Aydın Adnan Menderes University, for dermatological evaluation and treatment. A total of seven client-owned dogs of both sexes, aged 4 to 11 years, were enrolled in the study. The cohort included a heterogeneous group of breeds, namely Terrier, Pug, German Shepherd, and mixed-breed dogs, to ensure a broader representation of the small animal population.

Each animal was subjected to pre- and post-treatment assessments, comprising bioresonance measurements and manual lymphatic drainage (MLD) therapy, which were conducted under identical environmental and procedural conditions. Since all participating dogs were presented as part of routine clinical evaluations, the study was designed as a non-invasive observational

study, ensuring no additional interventions beyond standard veterinary care. Written informed consent was obtained from the owners before enrollment, and all procedures adhered to institutional ethical guidelines for the use of animals in clinical research.

## 2.2. Bioresonance Measurements

Bioresonance evaluations were conducted using the Quantum Pet Analysis device, a specialized diagnostic tool designed to assess electromagnetic frequency variations in biological systems. Prior to each session, the device was calibrated according to the manufacturer's specifications to ensure measurement accuracy. The bioresonance measurement protocol involved securing the sensor belt around the abdominal region, optimizing electrode contact for precise signal acquisition.

The device utilized integrated software to capture, analyze, and interpret oscillatory patterns in real time. The obtained measurements provided a comprehensive overview of the animals' electromagnetic responses, although only the lymphatic index parameters were selected for further evaluation (list of lymphatic index parameters to be inserted). These parameters were recorded systematically, ensuring consistency in data collection across all subjects.

The procedural setup for bioresonance measurement, including the placement of the sensor belt and the real-time data recording process, is illustrated in Figure 2.



**Figure 2.** Procedural setup for bioresonance measurement in dogs included in the study group with dermatological problems.

## 2.3. Manual Lymphatic Drainage

The manual lymphatic drainage (MLD) technique was applied as a structured therapeutic approach to stimulate lymphatic circulation and facilitate interstitial fluid mobilization. The massage protocol targeted three key lymph node regions: prescapular, popliteal, and mandibular

lymph nodes. A bilateral, symmetrical friction-based massage was administered, ensuring even distribution of applied pressure.

Each lymph node was subjected to a 5-minute massage session, resulting in a total application time of 30 minutes per animal. The MLD procedure was performed in a controlled clinical setting, under the supervision of a trained veterinary specialist, following standardized guidelines for lymphatic therapy in small animals. The specific massage techniques, including hand positioning and directional movements, were selected to optimize lymphatic flow while minimizing stress on the patient.

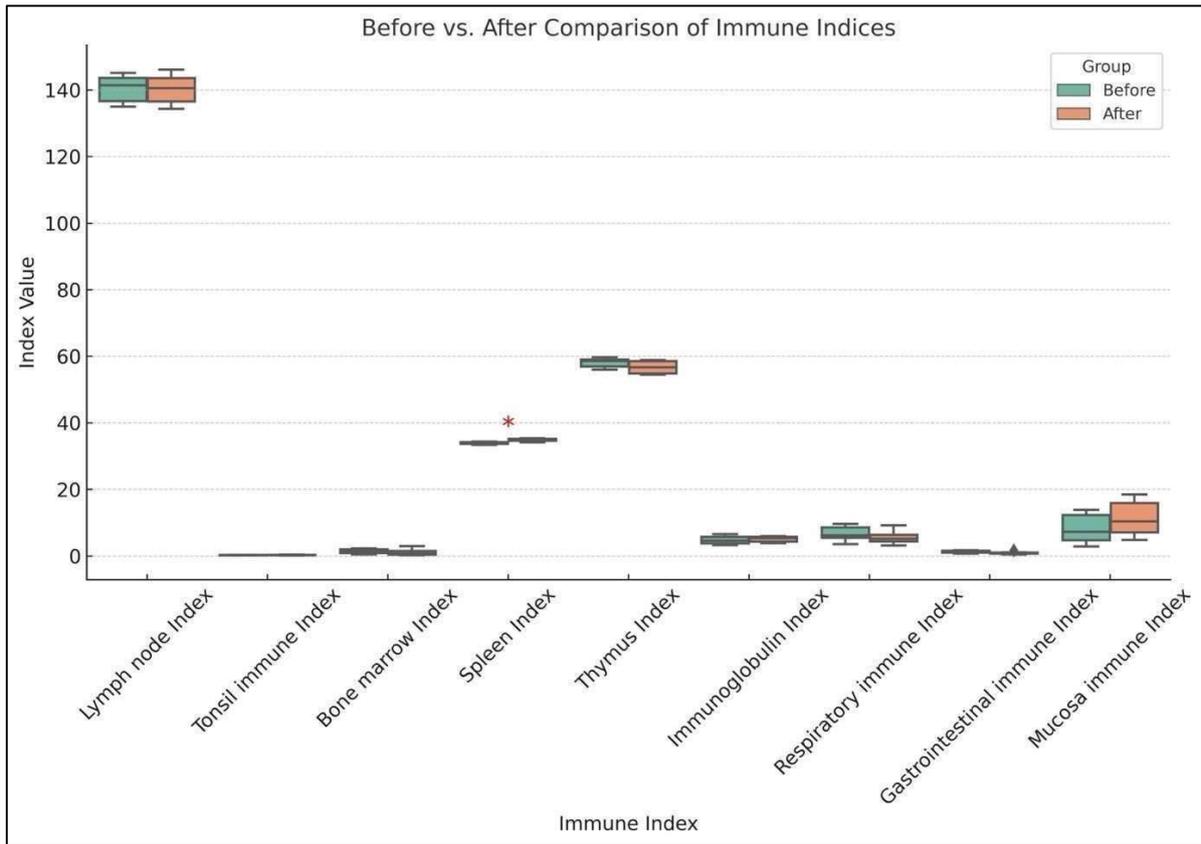
Visual representations of the MLD application, demonstrating manual technique, anatomical target sites, and session duration, are provided in Figure 2.

#### **2.4. Statistical Analyses**

All statistical analyses were conducted using RStudio (version 4.4.2 r-project.org). Descriptive statistics, including mean and standard deviation, were calculated for each immune index in both pre- and post-treatment groups using the dplyr package. To assess the normality of the data, the Shapiro-Wilk test was applied. For normally distributed data, paired t-tests were performed using the base t.test function with the argument paired = TRUE. For data not following a normal distribution, the Wilcoxon signed-rank test was employed. Data visualization was accomplished using the ggplot2 package, where boxplots were generated to illustrate the distribution of immune indices before and after treatment. Statistically significant differences ( $p < 0.05$ ) were indicated with an asterisk (\*) on the corresponding plots.

### **3. RESULTS**

The analysis of immune indices in dogs before and after treatment revealed varying degrees of changes across different parameters (Table 1, Figure 3). Descriptive statistical analysis demonstrated that the Spleen Index showed a statistically significant increase ( $p = 0.031$ ), suggesting a measurable impact of treatment on splenic function. The mean Spleen Index increased from  $33.95 \pm 0.38$  before treatment to  $34.91 \pm 0.48$  after treatment, representing a 2.83% increase.



**Figure 3.** Box plot of immune indices of dogs included in the study evaluated before and after MLD.

Conversely, other immune indices, including the Lymph node Index, Tonsil immune Index, Bone marrow Index, and Thymus Index, did not exhibit statistically significant differences between the pre- and post-treatment measurements ( $p > 0.05$ ). The Lymph node Index remained relatively stable, with a slight decrease of 0.13% in mean values post-treatment ( $140.43 \pm 4.34$  before vs.  $140.25 \pm 4.67$  after). Similarly, the Thymus Index declined by 2.37% post-treatment, but this change was not statistically significant ( $p = 0.218$ ).

The Tonsil immune Index demonstrated an increase of 12.45% following treatment, indicating an upward trend, though the difference did not reach statistical significance ( $p = 0.438$ ). In contrast, the Bone marrow Index exhibited the most notable decrease among the parameters, with a 21.89% reduction in post-treatment values ( $p = 0.313$ ), reflecting a potential suppression or modulation of bone marrow activity.

<b>Table 1. Immune index analysis in pre-treatment and post-treatment groups.</b>						
<b>Descriptive Statistics</b>						
	<b>Mean Before</b>	<b>Mean After</b>	<b>Std Before</b>	<b>Std After</b>	<b>Percentage Change (%)</b>	<b>P value</b>
<b>Lymph Node Index</b>	140.431	140.246	4.341	4.673	-0.131	0.941
<b>Tonsil Immune Index</b>	0.271	0.305	0.063	0.110	12.453	0.438
<b>Bone Marrow Index</b>	1.456	1.137	0.731	1.032	-21.899	0.313
<b>Spleen Index</b>	33.949	34.912	0.375	0.475	2.835	0.031
<b>Thymus Index</b>	58.075	56.698	1.511	2.033	-2.371	0.218
<b>Immunoglobulin Index</b>	4.805	5.061	1.322	0.918	5.323	0.689
<b>Respiratory Immune Index</b>	6.718	5.621	2.345	2.139	-16.326	0.396
<b>Gastrointestinal Immune Index</b>	1.283	0.935	0.371	0.401	-27.161	0.143
<b>Mucosa Immune Index</b>	8.217	11.328	4.725	5.624	37.865	0.305

*Std: Standard deviation*

#### 4. DISCUSSION

The present study investigated the immunomodulatory effects of quantum-pet-analysis bioresonance technology in dogs subjected to manual lymphatic drainage (MLD). The findings suggest a measurable impact on specific immune indices, particularly the Spleen Index, while other immune markers, including the Lymph Node Index, Tonsil Immune Index, Bone Marrow Index, and Thymus Index, did not exhibit statistically significant changes. These results provide novel insights into the physiological interactions between bioresonance diagnostics and MLD, a subject that remains underexplored in veterinary medicine.

Bioresonance therapy has been proposed as a non-invasive diagnostic and therapeutic tool, functioning by detecting and modulating electromagnetic frequency variations within biological systems (Farsijani & Safi, 2022). Its use in human medicine has expanded considerably, particularly in the diagnosis of viral diseases such as feline infectious peritonitis, where specific modulation frequency demonstrated high sensitivity and specificity compared to conventional diagnostic methods (Farsijani & Safi, 2022). In this context, bioresonance therapy's ability to interact with immune system parameters aligns with previous reports suggesting its potential role in immune homeostasis and regulation of biochemical pathways (Cabioğlu et al., 2022; Lambeck et al., 2007; Liu et al., 2013).

In our study, the observed 2.83% increase in the Spleen Index following treatment likely reflects a physiological effect of manual lymphatic drainage (MLD), as detected by the bioresonance

system, which was used solely as a non-invasive monitoring tool. The spleen plays a critical role in immune surveillance and response, and alterations in its functional status may indicate systemic immune modulation. This finding is in agreement with previous studies in rodent models, where massage-like mechanical stimuli were associated with increased T cell counts in lymphoid tissues (Lee et al., 2015; Major et al., 2015). Although our results do not directly confirm T-cell activation, they suggest that bioresonance therapy in conjunction with MLD may exert a localized or systemic immunological influence in veterinary subjects.

MLD is widely utilized in postoperative recovery, edema management, and adjunctive oncologic care (Affolter et al., 2013; Wittlinger et al., 2011). It facilitates lymph mobilization, promoting interstitial fluid clearance and reducing inflammatory responses (Ezzo et al., 2015; Jacobsen ve Eggers, 1997). In our study, MLD was systematically applied to prescapular, popliteal, and mandibular lymph nodes, ensuring bilateral stimulation and controlled pressure distribution. Despite its well-documented efficacy in enhancing lymphatic flow, no statistically significant changes were observed in the Lymph Node Index or Thymus Index, suggesting that short-term MLD applications may not induce immediate quantifiable immunomodulation in the examined parameters.

These findings align with existing literature, which suggests that the long-term efficacy of MLD depends on repeated application and precise technique (Ezzo et al., 2015). Moreover, MLD has been shown to contribute to stress reduction and autonomic nervous system modulation, factors that indirectly influence immune function (Vandergrift et al., 2013). However, while evidence from human and equine studies supports the use of lymphatic drainage in enhancing systemic immune responses, its isolated effects in veterinary medicine, particularly in combination with electromagnetic-based therapies, remain largely undefined. The combined application of bioresonance therapy and MLD represents a novel therapeutic approach, integrating electromagnetic modulation and mechanical lymphatic stimulation. The lack of statistically significant changes in other immune indices suggests that while bioresonance therapy may influence certain lymphoid organs (e.g., the spleen), its immediate impact on other immune markers is less pronounced. This observation highlights the necessity of further investigations incorporating longitudinal assessments, extended treatment durations, and larger sample sizes.

Additionally, the immune-modulating potential of bioresonance remains controversial in conventional veterinary medicine, with some sources questioning the reliability of unconventional diagnostic and therapeutic approaches (Wüthrich, 1998; Young et al., 1987). Critics argue that many diagnoses made using alternative bioresonance methods—such as food

intolerances to wheat, sugar, or dairy—are not supported by rigorous scientific validation. Moreover, concerns have been raised about the lack of standardized methodologies in bioresonance-based diagnostics, with some alternative practitioners advocating unconventional dietary modifications without evidence-based support (Wüthrich, 1998). These factors underscore the need for controlled clinical trials to differentiate between anecdotal benefits and scientifically measurable effects.

Although this study provides valuable preliminary data, several limitations must be acknowledged. The small sample size may have contributed to the lack of statistical significance in certain immune indices, emphasizing the need for larger-scale investigations. Additionally, the duration of treatment and follow-up period was limited, which may have affected the detection of long-term immunological shifts. Future studies should explore longitudinal effects, dose-dependent responses, and potential interactions with other adjunctive treatments.

Furthermore, while bioresonance technology has demonstrated promise in human and veterinary applications, its mechanistic underpinnings remain speculative. Rigorous biochemical and molecular analyses are required to validate its proposed mechanisms and therapeutic claims. The scientific skepticism surrounding bioresonance diagnostics necessitates further research efforts aimed at establishing objective, reproducible data that can substantiate or refute its clinical efficacy.

## **5. CONCLUSION**

The results of this study suggest that quantum-pet-analysis bioresonance therapy, in conjunction with manual lymphatic drainage, may exert selective immunomodulatory effects in dogs, particularly on splenic function. While the clinical significance of these findings remains to be fully elucidated, this study contributes to the growing body of literature investigating the integration of electromagnetic and manual therapies in veterinary medicine. Future research should aim to expand sample sizes, incorporate molecular assessments, and explore long-term immunological effects to further validate the potential role of bioresonance in clinical practice.

### **Conflict of Interest**

There is no conflict of interest in this study.

### **Author Contribution**

1. Conception – HE, SE, SP, CB, KU, 2. Design - HE, SE, SP, CB, KU, 3. Supervision - HE, SE, SP, CB, KU, 4. Fundings - HE, SE, SP, CB, KU, 5. Materials - HE, SE, SP, CB, KU, 6.

Data Collection and/or Processing- HE, SE, SP, CB, KU, 7. Analysis and/or Interpretation - HE, SE, SP, CB, KU, 8. Literature Review - HE, SE, SP, CB, KU, 9. Writing - HE, SE, SP, CB, KU, 10. Critical Review- HE, SE, SP, CB, KU.

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