

# THE EFFECTS OF CORONA DISCHARGE THERAPY

CHIAKI WADA  
TETSUO MURAMATSU (MD)  
KOJI SATO (MD)  
KENTARO MIMATSU (MD)

NITTO KAGAKU CO., LTD.

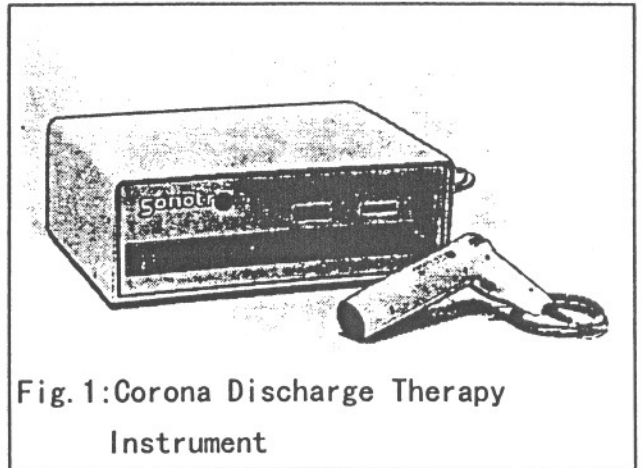
# The Effects of Corona Discharge Therapy

Chiaki Wada (a)  
Tetsuo Muramatsu (MD) (b)  
Koji Sato (MD) (b)  
Kentaro Mimatsu (MD) (c)

## INTRODUCTION

Corona discharge therapy for pain relief has been used in Japan for two years. Of the disease cases involving pain that were subjected to corona discharge therapy during this period of time, there were 488 cases of diseases related to the spine and the joints. We conducted research on these 488 cases in order to know whether the treatment was efficacious against pain, whether the pain relief effect, if any, was sustained from the time of treatment to the time of research, and how subjects felt about the treatment.

The instrument we used for corona discharge therapy (trade name *Sonotron*) emits electromagnetic waves



- 
- (a) Chiaki Wada  
Department of physical Therapy, Tokai Municipal Hospital
- (b) Koji Sato (MD)  
Tetsuo Muramatsu (MD)  
Department of Orthopedic Surgery, Tokai Municipal Hospital
- (c) Kentaro Mimatsu (MD)  
Department of Orthopedic Surgery, Nagoya University, School of Medicine

modulated from 3 to 5KHz from a discharge probe at a frequency of 430KHz. The clinician applied the electromagnetic waves and corona to the painful body part while controlling the quantity of discharge. In each treatment, the discharge was applied about ten times, for 15 seconds each time (controlled automatically), while moving the instrument around over the region being treated.

## SUBJECTS

The cases in this research study consisted of 488 subjects suffering from various painful diseases related to the spine and the joints. This group received our corona discharge therapy in the period from January 1992 to November 1993 (in case one person had several such diseases, such a person was counted as one case). The subjects consisted of 218 males and 270 females, and their average age was 57.5 years. They had received 9.6 treatments on average and 313 days had elapsed on average from the time they received the treatment to the time of the research.

## METHOD

The research was conducted by questioning the 488 subjects using a double postal card (Table 1). We received answers from 296 subjects (60.7%), and then classified them into 6 groups according to the related body parts; the neck, the shoulder joint, the elbow joint, the lumbar region, the knee joints and others. There were 34 cases of chronic multiple articular rheumatism, collagenosis, and others in which the region to be treated could not be identified, and such cases were excluded when we studied the results.

Table 1: The Questionnaire

1. Do you feel the pain now? How painful is it?
  - ① Not painful
  - ② Sometimes painful
  - ③ Always painful
  - ④ Acutely painful
  - ⑤ Very painful
  
2. Do you undergo any other treatment now?
  - ① Yes
  - ② No
  
3. Why did you stop coming to receive our treatment?
  - ① Cured
  - ② Unable to attend the hospital
  - ③ Found no advantage in our treatment compared to other conventional treatments
  - ④ Not efficacious
  - ⑤ Changed hospital
  
4. How much difficulty do you feel in making movement in your daily life?
  - ① No difficulty
  - ② Slight difficulty
  - ③ Moderate difficulty
  - ④ Extreme difficulty
  
5. How did you feel about the Sonotron treatment?
  - ① Very good
  - ② Good
  - ③ No difference from conventional treatments
  - ④ Not efficacious
  - ⑤ No impression

## RESULTS

The 262 cases consisted of 69 cases related to the neck, 41 cases related to the shoulder joint, 55 cases related to the lumbar region, and 80 cases related to the knee joint (Fig. 2).

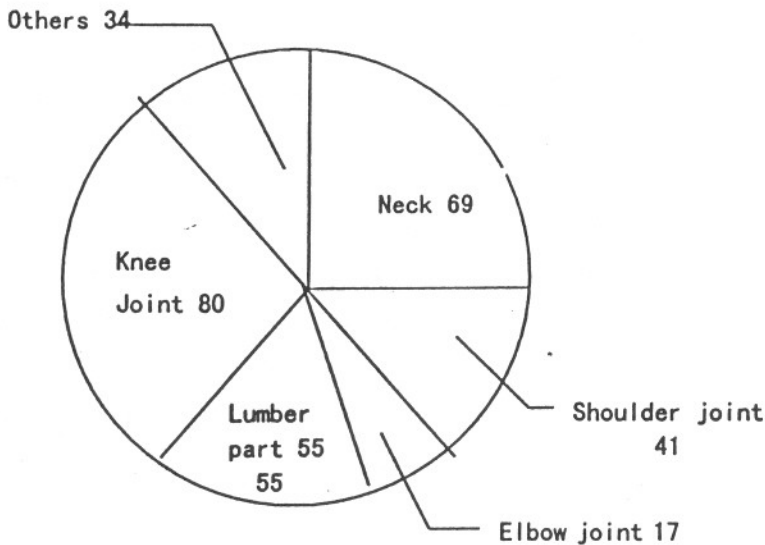


Fig. 2: Number of Cases Related to Various Parts

To question No.1, if you feel any pain presently and how bad it is, 78.3% of the neck group, 80.5% of the shoulder joint group, 82.3% of elbow joint group, 76.4% of the lumbar part group, and 70.0% of the knee joint group answered that they had no pain or sometimes had pain. In contrast, 21.7% of the neck group, 19.5% of the shoulder joint group, 17.7% of the elbow joint group, 23.6% of the lumbar part group

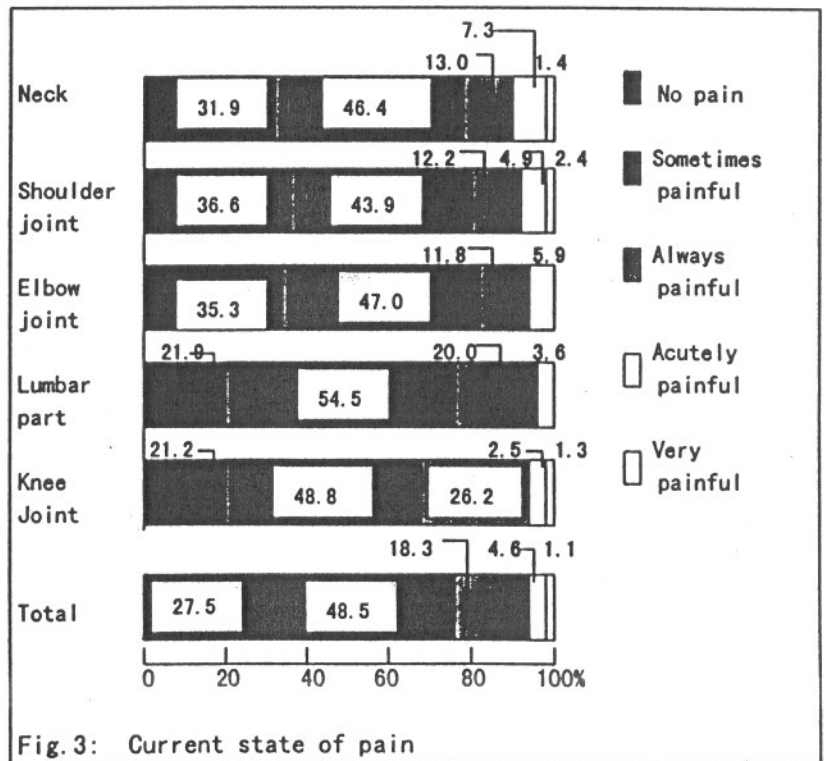


Fig. 3: Current state of pain

and 30% of the knee joint group answered that the related part was always painful, acutely painful or very painful. Thus, pain relief effect was found in 199 cases, 76% of the total, though about 20% of each group had pain even after the treatment (Fig. 3).

To question No. 2, if you undergo any other treatment, 73.9% of the neck group, 82.9% of the shoulder joint group, 100% of the elbow joint group, 74.5% of the lumbar part group, and 62.5% of the knee joint group answered in the negative. In contrast, 26.1% of the neck group, 17.1% of the shoulder joint group, 25.5% of the lumbar part group and 37.5% of the knee joint group answered that they were still under some treatment. In the total, 193 cases, 73.3% of the total answered that they were not under any treatment (Fig. 4).

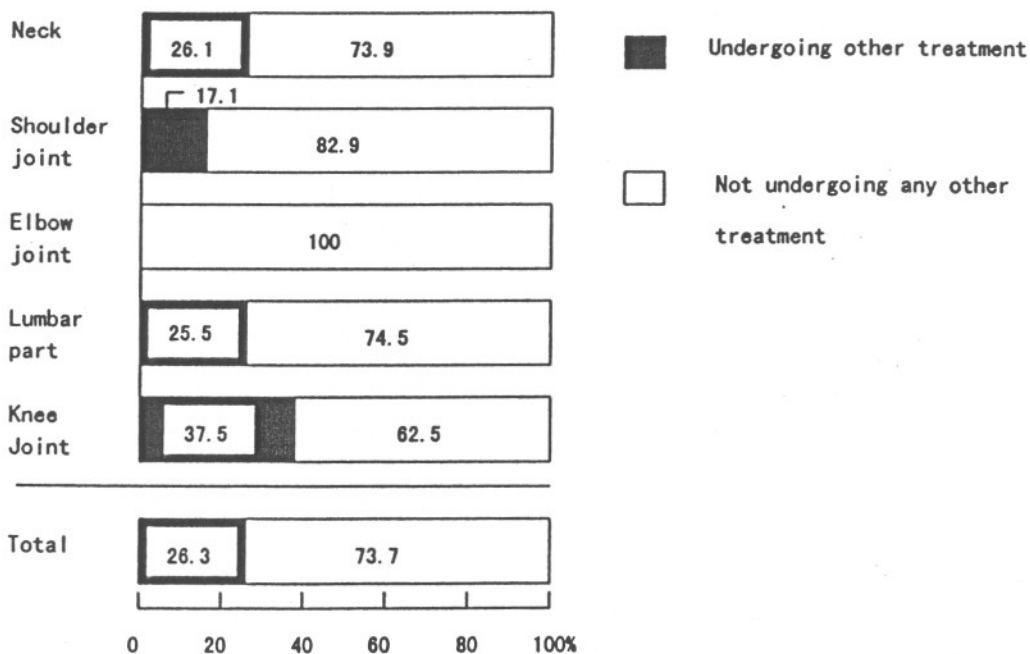


Fig. 4: Other Treatment

To question No. 3, why did you stop coming to receive our treatment, 40.3% of the neck group, 55.3% of the shoulder joint group, 46.7% of the elbow joint group, 41.9% of the lumbar part group and 33.9% of the knee joint group answered that their pain was cured after

undergoing the treatment. In contrast to this, 6.7% of the total answered that they found no special advantage in our treatment in comparison with other conventional treatments such as low-frequency or microwave therapy; 40.8% answered that they were unable to come to the hospital; 3.7% answered that our treatment was not efficacious against the pain, and 7.3% answered that they had changed hospital (Fig.5).

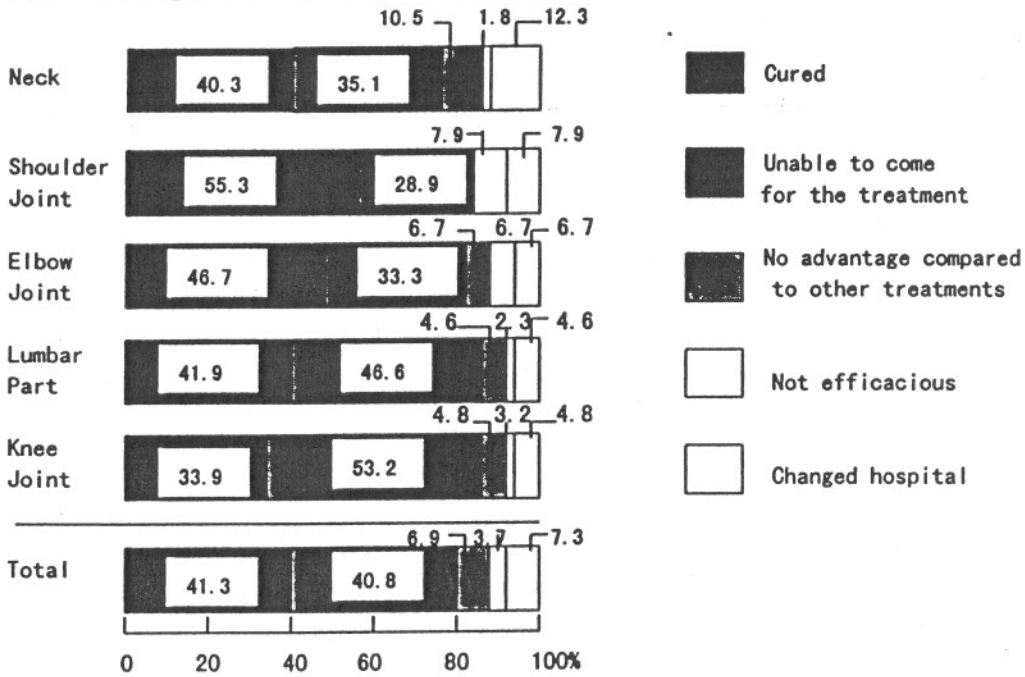


Fig.5 The reason why subjects stopped receiving treatment

To question No.4, how much difficulty did you feel in making movement in your daily life, 55.1% of the neck group, 78.1% of the shoulder joint group, 82.4% of the elbow joint group, 60% of the lumbar part group, 57.5% of the knee joint group, and 62.2% of the total answered that they had no difficulty in their daily life. However, 37.8% in total answered that they felt slight, moderate, or extreme difficulty, which means about one third of the total felt some difficulty in their daily life. Furthermore, two lumbar region subjects and one problem neck subject answered that they felt

it difficult to move and were unable to do anything (Fig.6).

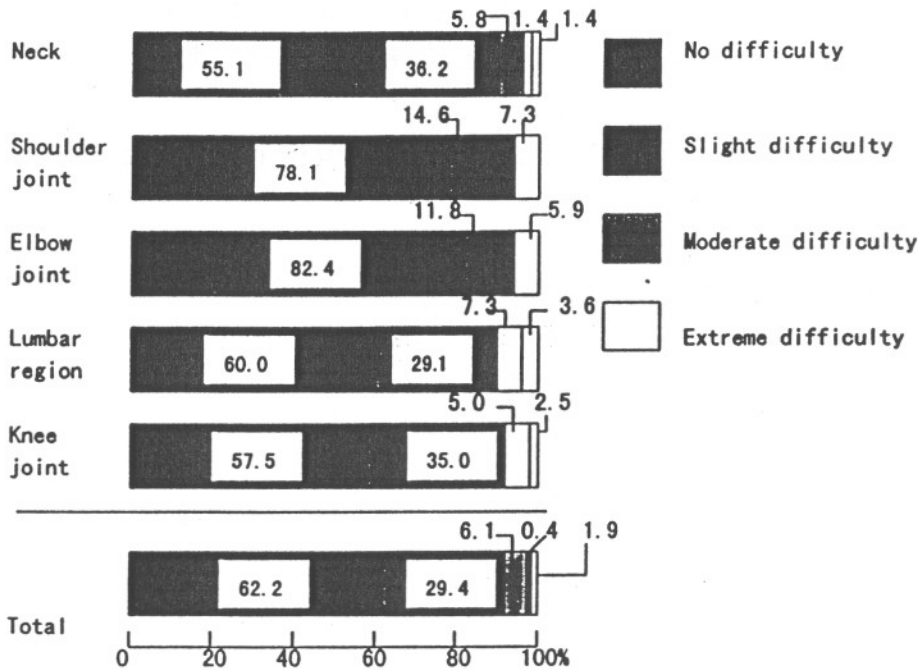


Fig.6 Making Movement in Daily Life

To question No.5, how do you feel about the corona discharge treatment, 78.2% answered that it was very good or good. Thus, corona discharge therapy made a favorable impression on most of the subjects. However, the remaining 21.8% answered that they had not found any advantage compared to other conventional treatment, or it was not good, or that it made no special impression on them (Fig. 7).

## OBSERVATION

As the result of our research on the effect of corona discharge therapy and the continuation of a beneficial effect, we found that more than 70% of the total number of subjects answered that their pain had been relieved. This finding; the fact that 313 days on



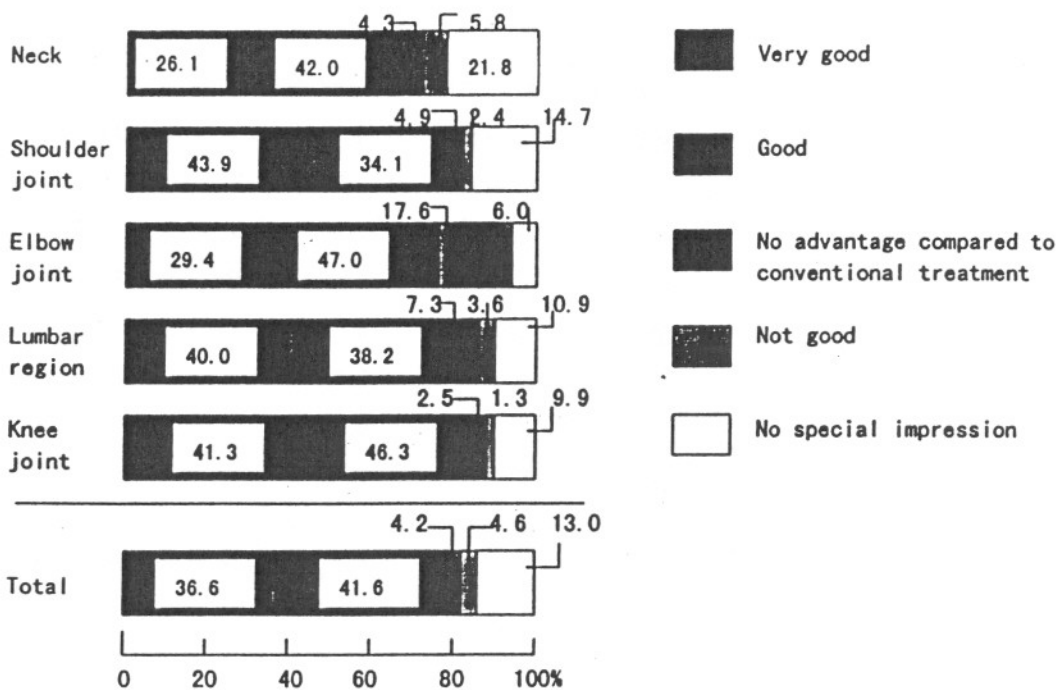


Fig7. Impression of Treatment

average had passed from the time subjects received the treatment when the research was conducted and that the average number of treatments they received was 9.6 demonstrates that the effect of treatment given for a relatively short duration continues for a long period of time. Furthermore, in cases of different diseases related to various body parts, similar results were revealed by the subjects' answers. Based on this, we concluded that the corona discharge therapy was likewise effective for a variety of diseased parts.

The 40.8% of subjects that answered that they stopped coming to receive the treatment because they were unable to come to the hospital were those who lived in a distant place, those who needed assistance to move around, or those who found it difficult to walk. On the other hand, 62.2% answered that they had no difficulty or little difficulty in their daily life. This implies that about 60% of the cases that had undergone the treatment became better and

found it easier to move about in daily life.

Apart from the present research, some of the subjects told us that during the treatment they felt soft warmth transmitted to a region of the body distant from the treated part, or that they felt a sensation of heat transmitted to peripheral parts of the body. Some of them also stated that this sensation of heat continued for a few hours. According to their explanation, these sensations were different from those from simple thermal or neural stimulation. When electromagnetic waves modulated at an acoustic frequency of 3 to 5KHZ are emitted from an applicator at a frequency of 430KHZ, corona discharge is generated at the same time. When the corona discharge reaches the counter electrode, electric current flows between the electrodes. Based on these facts, we believe that the human organism, during the treatment, receives the integrated effects of (1)the stimulation by the modulated 430KHz electromagnetic waves to the tissues, (2)the thermal stimulation by the corona discharge to the skin, and (3) the electric stimulation by *bridging* during the corona discharge (When voltage amplification causes one of two electrodes to discharge 'corona' is generated; further voltage amplification causes the corona to reach the counter electrode creating an electric current that flow between the electrodes – this is called bridging). These integrated effects made a favorable impression on the patients.

#### SUMMARY

1. Pain relief effect was found in 75% of the cases that had undergone the treatment, and no difference in the effect was found among the different body parts treated.
2. Treatment performed for a relatively short duration gave a continuous effect for a long period of time.
3. Corona discharge therapy made a favorable impression in 78% of

**the cases.**

**Physiotherapy Vol. 24, No. 4, Serial No. 92**

**Published on February 1 1995**