THE IMPORTANCE OF THERAPIST EDUCATION AND MOTIVATION ON DIODE LLLT EFFICACY IN PAIN THERAPY: A COMPARATIVE STUDY

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LLLT has made great advances, especially over the past decade. However, little attention has been paid to standardizing laser therapist training, and motivation. In Spring of 1990 the author opened a new annexe to his main Goshogawara clinic in a nearby agricultural town. The clinic was staffed with therapists trained in the main clinic. At the end of 18 months, the results from the two clinics were compared over an identical range of pain entities. Both clinics were using the Luketron GaAlAs diode laser (830 nm, 60 mW, c/w). The male:female ratio was 1:1.5 both for the annexe and for the main clinic. The average age for the annexe patients was 55.1 y.o., (M:54.1, F:56.9) and for the main clinic 54.9 (M:53.8, F:55.7). There were no major statistical differences between the two clinics as far as treatment sessions per symptom, and the average number of sessions per patient. However, the overall efficacy rate for the annexe was 63.7%, compared with 81.3% for the main clinic. This could not be explained by a major difference in any of the age, disease or treatment statistics. It was finally discovered that the attitude of the therapists in the annexe to their treatment was very different, mainly because they felt they had been 'exiled' to the smaller and much more agricultural town. Despite having received the same training, and using the same equipment as the therapists in the main clinic, their enthusiasm and attitude to the treatment and the patients was much less positive than in the main clinic. This shows that the training, including the mental attitude of the therapists should be of equal importance to a clinic director as the actual treatment of the patients.

KEY WORDS Total treatment concept Laser therapist training Doctor/therapist rapport

Introduction

I have reported in previous studies on the efficacy of the diode laser in LLLT for a variety of chronic and acute pain types. Analysis of the data has given a consistent overall efficacy rate of near the 82% mark (82% in 1989 and 81.3% in 1993).¹⁻² I have established a rigorous training programme for my therapist staff, based on the programme devised and reported by Ohshiro.³ My main clinic is located in a large town, mainly agricultural, in Aomori Prefecture in the north of Japan. As the number of patients travelling in from outlying districts steadily increased, I felt it necessary to open an annexe to the main clinic in a smaller, much more agricultural community about 30 min drive to the north of the main clinic. It opened in June of 1990. I had been collecting data from the main clinic

since 1984, and I collected the data for the same group of pain entities in both clinics.

Laser System

The laser system I used in the new annexe was the GaAlAs diode laser system developed jointly by the Japan Medical Laser Laboratory, and marketed by Mochida Pharmaceutical company as the Luke-tron® LLLT system. This delivers 60 mW in continuous wave at a wavelength of 830 nm. The laser is applied in the contact pressure technique as advocated by Ohshiro, Nagasawa and myself.^{1, 4, 5} Depending on the body site, the degree of pressure is varied. Light pressure is applied on areas where there is little tissue between the laser head and the underlying bone. Parts of the body with large muscle groups, such as the shoulder complex or the buttocks, respond better to very strong pressure. The tender points and related areas are irradiated for approximately 3 s – 15 s per point, the number of points depending on the area and degree of pain. I apply Ohshiro's 'proximal

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Table 1. Data breakdown for clinic annexe patient population

Period of time	June 1990 to January 1992 (18 months)
Total number of patients	811 (M 323, F 488) Ratio M:F = 1:1.5
Total number by symptoms	1226 symptoms (M 399, F 827) Ratio M:F = 1:2.1
Number of symptoms per patient	1.5 symptoms (M, 1.2, F, 1.7)
Average age	55.1 years old (M 54.1y, F 56.9y)
Total number of sessions	21065 sessions
Average sessions per symptom	17.2 sessions
Average session per patient	26.0 sessions
Minimum number of sessions	1 session
Maximum number of sessions	303 sessions
Average duration per session	535 seconds (8 min 55 s) per symptom 789 seconds (13 min 9 s) per patient
Overall efficacy rate (%)	63.7%

priority' technique,⁶ where therapy is started from a point proximal to the painful area on the nerve, blood vessel or any other anatomical system being targeted. The laser is then gradually moved distally, treating the painful area last. Patients attend once or twice per week.

Table 2. Main pain entities in study, showing muscle pain subsets

Pain	Muscle pain	Shoulder
	Lumbago	
	Knee arthritis	
	Shoulder peri-arthritis	
	Ischiatic pain	
	Rheumatism	Lower extremity
	Numbness	
	Elbow arthritis	
	Tendinitis	Upper extremity
	Occipital pain	
	Trigeminal pain	Upper torso
	Tinitis	
	Intercostal pain	Whole body

Patient Population

From June 1990 to February 1992 (18 months) 811 patients attended the annexe, 323 male and 488 females, giving a male:female ratio of 1:5.1. There were a total of 1226 symptoms, meaning that some patients had multiple symptoms: this worked out to an average of 1.5 symptoms per patient (1.2 per male, 1.7 per female). The average age of the patients was 55.1 y.o., for males 54.1 y.o., females 56.9 y.o. There was a total of 21 065 sessions, with 17.2 sessions on average per symptom, and 26 sessions per patient. The average duration per session was 535 seconds per symptom, and 789 seconds per patient. These data are summarized in Table 1.

Table 3. Pain entities broken down by number and efficacy rate from annexe data, with the efficacy rate from main clinic shown for comparison

Symptom	Number	Treatment efficacy					Efficacy (annexe) [(+++)+(+)]	Efficacy (main) [(+++)+(+)]
		Excellent (+++)	Good (++)	Fair (+)	No change (±)	Worse (-)		
Muscle pain	353	18.2	56.3	23.1	2.4	0	74.5	84.6
Lumbago	381	14.2	60.1	22.1	3.6	0	74.3	86.0
Knee arthritis	194	54.2	35.4	9.5	0.8	0	89.6	86.9
Shoulder peri-arthritis	106	20.1	54.0	23.4	2.5	0	74.1	84.2
Ischiatic pain	79	20.0	59.0	19.0	2.0	0	79.0	83.9
Rheumatism	22	5.8	48.0	43.9	2.3	0	53.8	74.8
Numbness	54	7.0	69.0	22.0	2.0	0	76.0	81.8
Elbow arthritis	12	14.2	42.4	31.3	12.1	0	56.6	76.5
Tendinitis	5	32.0	24.0	44.0	0	0	56.0	78.0
Occipital pain	0	0	0	0	0	0	0	84.0
Trigeminal pain	10	0	11.0	65.4	23.6	0	11.0	68.6
Tinitis	8	4.1	51.8	38.7	5.4	0	55.9	82.1
Intercostal pain	2	50	50	0	0	0	100.0*	85.2
Total/mean†	1,226						63.7 ± 21.06	81.3 ± 5.32

*Intercostal pain rate excluded from annexe mean efficacy rate calculation, because only two patients.

†Value for mean ± standard deviation.

Pain Group and Results

Pain was broken down into 13 main entities as shown in Table 2, with the large muscle pain group further subdivided. Table 3 shows that data on patient distribution and final effectiveness for the 13 main entities as treated in the annexe, and for comparison the effective rate for the same entities in the main clinic. Please note that only the top two rates, excellent and very good, are used to assess the overall effective rating, thereby perhaps removing some of the placebo effect which might account for the third rank scores. Also, when calculating the mean value for the annexe efficacy rate, the high value for efficacy in intercostal pain treatment is not included, because there were only two patients in that group. The mean efficacy rate in the annexe was only 63.7%, compared with 81.3% in the main clinic. Figure 1 graphically compares the differences between the main clinic and the annexe efficacy rates, broken down by the same symptom type.

Discussion

This difference in efficacy rates, for the same pain entities, using the same lasers, with therapists who were trained in the main clinic, was very surprising. At first we thought that there might be some difference in the spread of pain entities: there were minor differences, as seen in Figure 2, but not enough to explain a 20% difference in efficacy. The biggest difference was seen in the relative percentage of knee arthritis patients, but the efficacy rate for that symptom was actually slightly higher in the annexe than the main clinic (89.6% compared to 86.9%, respectively). It was suggested that the patients at the annexe, living in a more rural setting, might possibly have endured harder working lives. We could not compile any data on that, but the pain symptom relative percentage showed a lower percentage of muscle pain patients, and a higher percentage of knee arthritis and numbness, but without statistically significant differences. We therefore did not think that the potential accelerated

Figure 1. Overall efficacy rate (% of population) broken down by pain symptom. Annexe and main clinic compared

Figure 2. Pain symptoms shown as a relative percentage of the total number of symptoms. Annexe and main clinic compared

aging associated with the agricultural background was so important. There was no great difference in the mean ages (annexe: 55.1, main: 54.9), or the male:female ratio (annexe: 1:1.5, main: 1:1.5). The average number of sessions per symptom was 17.2 in the annexe, and 14.2 in the main clinic; the average number of sessions per patient was 26.0 for the annexe, and 25 in the main clinic. There was a minor difference in the average duration per session, per symptom: 535 s (8 min 55s) in the annexe, and 454 s (7 min 34 s) in the main clinic. This meant that each symptom was treated for just over a minute longer in the annexe. However, the figures for average duration per session, per patient, were 13 min 9 s for the annexe, and 13 min 27 s for the main clinic: no major difference.

Finally, in interviews with the therapists who had been transferred to the annexe, it came out that they were very unhappy at my having selected them for the annexe posts. Even though there was no problem for them in getting to the annexe, they felt that this was not a real promotion, which is what I thought it was, because of the rural aspect of the building. It was a brand-new, custom built

clinic, with all modern fittings, in many ways better equipped than the main clinic, which is an older building.

Ohshiro in an earlier *Laser Therapy* Editorial³ advocated the importance of a well-integrated education programme for laser therapists. I already subscribe to Ohshiro's Total treatment Concept,⁷ and look after both the physical and psychological aspects of my patients' pain: especially in the case of the long-term chronic pain patient. In addition this experience has shown us, and me in particular, as Director of the clinic, that the psychological well-being of my clinics' therapists is also important. It was obvious from my interviews with the therapists concerned that I had not taken into account the fact that they were happy in the main clinic, and resented being transferred to the annexe: in fact they looked on it almost as an exile, even though the clinic is only 30 min' drive from the city where my main clinic is, and it was a form of promotion. Perhaps the solution to the problem is to establish a rota system, so that none of the therapists feels that they are being pushed out into a 'less important' or 'less rewarding' role. The important lesson for

me has been that, while the doctor/patient rapport is important, the relationship between the clinicians and the therapists in any clinic must also be an integrated part of the Total Treatment Concept.

References

1. Shiroto, C., Keiichi, O. and Ohshiro, T. (1989). Retrospective study of diode laser therapy for pain attenuation in 3635 patients: detailed analysis by questionnaire. *Laser Therapy* 1 (1), 41–47.
2. Shiroto, C. (1993). Update on diode laser LLLT for acute and chronic pain entities: retrospective study of 7700 patients in a 94-month period. *Laser Therapy* accepted for publication.
3. Ohshiro, T. (1992). Integrated education for therapists. *Laser Therapy* 4 (2), 51–53.
4. Ohshiro, T. (1989). Treatment techniques to achieve superficial and intermediate LLLT irradiation. *Laser Therapy* 1 (3), 153–156.
5. Nagasawa, A. and Kato, K. (1991). A useful low-reactive laser therapy methodology: the contact pressure technique. *Laser Therapy* 3 (2), 87–92.
6. Ohshiro, T. (1991). Lymphatic control. *Low Reactive-Level Laser Therapy: Practical Application*. pp. 55–62. John Wiley & Sons, Chichester.
7. Ohshiro, T. (1991). Total systemic control: a combination approach. *Low Reactive-Level Laser Therapy: Practical Application*. pp. 63–73. John Wiley & Sons, Chichester.