Comparative studies of 1-day transdermal fentanyl and 3-day transdermal fentanyl : Efficacy of opioid switching and tolerability associated with up-titration

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Introduction

Purpose

To compare efficacy of opioid switching and tolerability associated with up-titration between 3-day transdermal fentanyl patches(3DP) and 1-day transdermal fentanyl patches(1DP).

Background

- 1DP are more popularly used in Japan.
- Its popularity is said to be based on the Japanese lifestyle.
- The pharmacological qualities are said to be “almost” equal between 1DP and 3DP, which are the worldwide standard.
- The actual clinical differences between 1DP and 3DP are unknown.
- If the difference can be determined, proper use can be achieved and appropriate pain control may be possible.

Patients and Methods

Retrospective study of the electronic medical record was conducted. Cancer patients who had achieved pain control with other opioids and switched appropriately to either 1DP (Fentos Tape®) or 3DP (Durotep MT Patch®) was targeted. From these patients, a patient ratio of those who continued to have adequate pain control were compared. Adequate pain control was defined as “Rescue≤2 doses/day, and STAS(pain control)≤1, and side effects were tolerable” consecutively for 3 days. For those patients who did not have continued pain control, days required to re-achieve pain control were recorded. For patients who had an up-titration due to pain aggravation, and continued usage was abandoned due to adverse events, a comparative study was made by dividing the concentration raise into 4 phases .

	phase 1	phase 2	phase 3	phase 4
Concentration raise (μg/h)	12.5 to 25	25 to 50	50 to 75	above 75
1DP raise (mg)	1 to 2	2 to 3	3 to 4	Above 4
3DP raise (mg)	2.1 to 4.2	4.2 to 6.3	6.3 to 8.4	Above 8.4

Patient characteristics :

	1-day patches (n=100)	3-day patches (n=59)
Age (years), mean (sd)	73 (11.5)	70 (10.3)
Female	46 (46%)	29 (49%)
Body mass index (kg/m ²), mean (sd)	19.3 (3.8)	21.1 (7.3)
Serum albumin concentration (g/dL), mean (sd)	2.93 (0.67)	2.79 (0.60)
Use of opioids until start of transdermal fentanyl		
Oral morphine	6 (6%)	0 (0%)
Parenteral morphine	8 (8%)	12 (20%)
Oral oxycodone	69 (69%)	45 (76%)
Parenteral oxycodone	2 (2%)	0 (0%)
Oral tramadol	15 (15%)	1 (2%)
Oral dihydrocodeine	0 (0%)	1 (2%)
Oral morphine equianalgesic dose (mg), median (range)	30 (5-240)	30 (7.5-150)
Primary tumor		
Gastrointestinal	27 (27%)	21 (36%)
Urogenital	24 (24%)	9 (15%)
Lung	18 (18%)	9 (15%)
Pancreas	10 (10%)	9 (15%)
Breast	10 (10%)	4 (7%)
Liver	7 (7%)	4 (7%)
Others	4 (4%)	3 (5%)

The use of 1DP and 3DP was overlapped for 2 years during the observation period of 8 years.

Result 1 : Efficacy of opioid switching

Time needed for pain control re-achievement of 1DP and 3DP

The 1DP group had a higher rate of continued pain control after switch (83.0%vs61.0%, OR:3.12, 95%CI:1.49-6.53, p=0.0026). Furthermore, the 1DP group had more patients who re-achieved pain control within 10 days.

Result 2 : Tolerability of titration

A comparative study of adverse events was made by dividing the concentration raise into 4 phases.

The 1DP group had higher rates of patients who underwent up-titration and continued usage was abandoned (18.2%vs12.1%, OR:1.62, 95%CI:0.62-4.22, p=0.32). The intolerance of phase1 especially stood out.

Conclusions

The 1DP switches more effectively than the 3DP, however, tends to have safety disadvantages after up-titration. Due to being a retrospective study, there may be diversities in patient background and thus affecting the results. However, the clinical difference is still significant and it can be said that further study is necessary. If pharmacokinetical discrepancies can be identified, we can expect a more effective and safe use of transdermal fentanyl.