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Switching from oral ropinirole to ropinirole transdermal patch in patients with Parkinson's Disease: an observational study

Yuki Yasutaka[1, 2], Takayasu Mishima[3], Shinsuke Fujioka[3], Kentaro Ogata[1, 2], Hidetoshi Kamimura[1, 2], Yoshio Tsuboi[3]

[1]Department of Pharmaceutical and Health Care Management, Faculty of Pharmaceutical Science, Fukuoka University, Fukuoka, Japan
[2]Department of Hospital Pharmacy, Fukuoka University Hospital, Fukuoka, Japan
[3]Department of Neurology, Faculty of Medicine, Fukuoka University, Fukuoka, Japan

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To the Editors

The ropinirole transdermal patch (TP) has emerged as a highly safe drug capable of achieving continuous dopaminergic stimulation [1], with clinical trials having demonstrated its efficacy and safety [2]. However, there is limited evidence that switching from various dopamine agonists to a ropinirole TP can be performed seamlessly.

This study aimed to retrospectively investigate the efficacy and safety of switching from oral ropinirole to a ropinirole TP in a clinical setting. The participants were patients with Parkinson's Disease who had met the established clinical diagnosis for PD and were prescribed ropinirole TPs from December 2019 to November 2022 at the Department of Neurology, Fukuoka University Hospital, Japan (Suppl. Fig. 1). We calculated the one-year continuation rate of ropinirole TPs and the change in levodopa equivalent dose (LED) before and after ropinirole TP usage in 11 patients who were taking oral ropinirole before starting to use ropinirole TPs. The LED was calculated based on previous reports [3, 4].

In Japan, ropinirole TPs are available in five specifications containing 8 mg, 16 mg, 24 mg, 32 mg, or 40 mg of ropinirole hydrochloride (1.5 mg/cm^2) and are covered by insurance for use up to 64 mg/day. The ropinirole TP dose is based on the area under the blood concentration-time curve (AUC) calculated from the plasma ropinirole concentration after treatment with a ropinirole sustained-release tablet (Supplementary Table 1).

All 11 participants were taking prescribed levodopa. Among them, four underwent deep brain stimulation and none underwent levodopa-carbidopa continuous infusion gel therapy. Ropinirole TPs were prescribed to nine participants during outpatient visits, while two received prescriptions during hospitalisation. The protocol for switching from oral ropinirole took place overnight in all patients. Table 1 shows the changes in LED before and after initiation, the initial dose of ropinirole TP, whether the ropinirole TP dose was increased after initiation, and the time to discontinuation.

The one-year continuation rate was 45.5% (5/11). Of the six patients who discontinued ropinirole TPs, two discontinued due to skin disorders and subsequently transitioned to oral ropinirole. Patient 1 discontinued treatment without using topical skin products. Patient 2 experienced skin disorders five weeks after starting ropinirole TPs and was prescribed topical steroids for treatment but discontinued the prescription after two weeks due to pruritus.

Among the four patients (Patients 3, 4, 5, and 6) who discontinued ropinirole TPs due to their poor efficacy, all

Address for correspondence: Takayasu Mishima and Yoshio Tsuboi, Department of Neurology, Faculty of Medicine, Fukuoka University, Fukuoka, Japan; e-mail: mishima1006@fukuoka-u.ac.jp and tsuboi0202@gmail.com
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Table 1. Summary of clinical course in 11 patients who switched from oral ropinirole to ropinirole transdermal patch

Patient	Discontinuation	Reason for discontinuation of medications	AAO (years)	Sex	DD (years)	DAT	Duration of oral ropinirole administration (week)	LED (mg/day)			Final dose of oral ropinirole before switching to TP (mg)	Initial dose of ropinirole TP (mg)	Increase in the amount	Time to discontinuation (week)
								Before switching	After switching	Change				
1	Yes	Skin disorder	67	F	8	–	5	465.0	465.0	0.0	2	8	Yes (5 weeks later)	21
2	Yes	Skin disorder	59	F	5	DBS	ND	500.0	500.0	0.0	10	40	No	7
3	Yes	Poor efficacy	64	M	8	–	231	575.0	575.0	0.0	10	40	No	6
4	Yes	Poor efficacy	68	F	13	–	70	710.0	710.0	0.0	8	32	No	4
5	Yes	Poor efficacy	69	F	6	–	99	710.0	750.0	+ 40.0	8	40	No	4
6	Yes	Poor efficacy/ /dyskinesia	71	F	14	DBS	ND	1,360.0	1,360.0	0.0	8	32	No	1
7	No	–	59	F	10	–	ND	340.0	340.0	0.0	2	8	No	–
8	No	–	72	F	4	–	88	380.0	340.0	– 40.0	4	8	Yes (5 weeks later)	–
9	No	–	75	M	6	–	59	520.0	560.0	+40.0	6	32	No	–
10	No	–	61	F	8	DBS	ND	778.5	818.5	+40.0	4	24	Yes (5 weeks later)	–
11	No	–	68	F	6	DBS	ND	780.0	820.0	+40.0	4	24	No	–

AAO — age at onset; F — female; M — male; DD — disease duration; DAT — device-assisted therapy; DBS — deep brain stimulation; ND — not determined; LED — levodopa equivalent dose; ropinirole TP — ropinirole transdermal patch

maintained at least the LED upon transitioning. Of the five patients (Patients 7, 8, 9, 10, and 11) who continued using ropinirole TPs for one year: Patient 7 commenced with an equivalent LED at the onset of using ropinirole TPs; and Patient 8 started with a 40 mg reduction in LED at the initiation of ropinirole TPs but increased the patch dosage in the fifth week. The LED for Patients 7 and 8 with ropinirole TPs was 340 mg and 380 mg, respectively, which were relatively small amounts. Three patients (Patients 9, 10, 11) increased their LED by 40 mg at the initiation of patch treatment.

This study highlights that, when switching from oral ropinirole to ropinirole TPs, even when started at an equivalent LED, discontinuation may occur due to poor efficacy early in the initiation phase. The reason why the dose is not increased after switching may be because, in clinical practice, the original oral ropinirole preparation is often reverted to when the effect is insufficient.

The dose of ropinirole TP is established based on the equivalent conversion of AUC of oral ropinirole, and the conversion rate is clinically recommended for switching [2]. It is also reported that the blood concentration of ropinirole TPs reaches a steady state within four days of initiation, but the pharmacokinetics of the oral and patch forms of ropinirole are different. While oral ropinirole exhibits relatively clear peak and trough plasma concentrations, the patch maintains a stable and flat plasma concentration, requiring time to reach a steady state. Consequently, since the patch takes time to take effect, patients' perceptions of effectiveness may vary.

Patient 6 initiated the use of ropinirole TP during hospitalisation. However, due to poor efficacy, it was discontinued the following day at the patient's request. Three patients (Patients 3, 4, and 5) discontinued the use of ropinirole TP during follow-up outpatient visits, citing poor efficacy. Patient 8 had a decrease in LED at the initiation of the ropinirole TP, but the patch dose was increased at the next outpatient visit, ultimately leading to its continuation for one year.

Limitations of this study include its retrospective, observational nature, and being based on data from a single institution. It was also difficult to identify the exact date of onset of adverse events in outpatients. In addition, given the small sample size of only 11 patients, we cannot assert that the results of this study are universal. Therefore, further studies are needed to address these limitations.

This study suggests that when switching from oral ropinirole to ropinirole TPs, it takes time to achieve a therapeutic effect, even when LED is maintained. Our findings emphasise the need for patients to weather this transition period until the therapeutic effect has been felt, and in this way to prevent early dropout due to perceived inadequate efficacy. Therefore, we stress the importance of informing patients about the delay in the onset of efficacy.

Article information

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References

1. Antonini A, Odin P. Pros and cons of apomorphine and L-dopa continuous infusion in advanced Parkinson's disease. Parkinsonism Relat Disord. 2009; 15 Suppl 4: S97–100, doi: 10.1016/S1353-8020(09)70844-2, indexed in Pubmed: 20123567.
2. Mochizuki H, Hattori N, Hasegawa K, et al. Long-term study of ropinirole patch in Parkinson's disease patients with/without basal l-dopa. Parkinsonism Relat Disord. 2021; 83: 105–109, doi: 10.1016/j.parkreldis.2020.12.023, indexed in Pubmed: 33497892.
3. Tomlinson CL, Stowe R, Patel S, et al. Systematic review of levodopa dose equivalency reporting in Parkinson's disease. Mov Disord. 2010; 25(15): 2649–2653, doi: 10.1002/mds.23429, indexed in Pubmed: 21069833.
4. Schade S, Mollenhauer B, Trenkwalder C. Levodopa equivalent dose conversion factors: an updated proposal including opicapone and safinamide. Mov Disord Clin Pract. 2020; 7(3): 343–345, doi: 10.1002/mdc3.12921, indexed in Pubmed: 32258239.