Comparative Powder Characterization and In Vivo Evaluation of Solvent-Wetted and Kneaded L-Sulpiride-Loaded Solid Dispersion
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Purpose
To compare the physicochemical properties, solubility, dissolution and oral absorption of solvent-wetted (SWSD) and kneaded L-sulpiride-loaded solid dispersion (KNSD).

Methods
The SWSD and KNSD were prepared with silicon dioxide, sodium laurylsulfate and D-¥á-tocopheryl polyethylene glycol 1000 succinate (TPGS) using a spray dryer and high shear mixer, respectively. Their physicochemical properties, solubility, dissolution and oral absorption were assessed compared to L-sulpiride powder.

Results
The drug in SWSD was in the amorphous state; however, in KNSD, it existed in the crystalline state. The SWSD with a drug/sodium laurylsulphate/TPGS/silicon dioxide ratio of 5/1/2/12 gave the high drug solubility (3.01 ± 0.09 vs. 2.61 ± 0.19 mg/ml) and dissolution (92.6 vs. 76.3% at 30 min) compared to the KNSD. The oral absorption of drug in the SWSD was considerably higher than the KNSD and L-sulpiride powder (p < 0.05) with about 1.4- and 3.0-fold improvement, respectively, owing to better solubility and diminution in crystallinity. Furthermore, half dose of the SWSD was bioequivalent of commercial L-sulpiride-loaded product in rats.

Conclusion
The SWSD would be recommended as an alternative for the L-sulpiride-loaded oral administration.