Two simple methods, ultra violet spectroscopy and high performance thin layer chromatography for the determination of ropinirole in tablet dosage form are described. Detection wave lengths for spectrophotometric and high performance thin layer chromatographic methods were found to be 250 nm and 254 nm, respectively. For the spectrophotometric method, the linearity was found to be in the range of 5-30 µg/ml and for high performance thin layer chromatographic method; linearity was found to be between 40 and 120 µg/ml.

Key words: Ropinirole, ultra violet spectroscopy, high performance thin layer chromatography, validation

For the spectrophotometric method, aliquots of standard ropinirole solutions ranging from 5-30 µg/ml (from stock solution of 100 µg/ml) were prepared using ethanol and absorbances were noted at 250 nm. Calibration curve was drawn by plotting absorbances of ropinirole versus concentration of respective drug solutions. Twenty tablets of ropinirole were weighed and average weight was calculated. Quantity of powder equivalent to 10 mg was weighed accurately and transferred to a 100 ml volumetric flask. The filtered solution was further diluted to get requisite concentrations and analyzed as described under the procedure for pure sample.

For the HPTLC method, standard stock solution Ropinirole chemically known as 4-[2-(dipropylamino)ethyl]-1,3-dihydro 2H–indol-2-one, is used as an antiparkinsonian drug. Liquid chromatographic methods has been reported for determination of ropinirole in dosage form and plasma. Neither spectrophotometric nor high performance thin layer chromatography (HPTLC) methods have been reported for estimation of ropinirole from formulation. The present communication reports two simple, precise and accurate spectrophotometric and HPTLC methods for the estimation of ropinirole from tablet dosage form.

All chemicals and reagents used were of analytical grade and purchased from S. D. Fine Chemicals Ltd., Mumbai and Qualigens Fine Chemicals Ltd., Mumbai. A Jasco V-530 UV/Vis spectrometer was used for absorbance measurements and Camag HPTLC system (with TLC Scanner 3, Wincats Software and Linomat 5 as application device) was employed for peak area measurements.

Absorbance occurs because of π electrons present in the structure. Ropinirole consists of π electrons which are responsible for absorbance. It shows the maximum absorbance in ethanol at 250 nm.

For the HPTLC method, standard stock solution
of ropinirole (1000 µg/ml) and aripiprazole (1000 µg/ml) were prepared in ethanol. The solution was further diluted with ethanol to obtain a series of concentrations ranging from 40 to 120 µg/ml of ropinirole, each containing 60 µg/ml of aripiprazole. Five microlitres from these solutions were applied on precoated TLC plate. The plate was analyzed photometrically and chromatograms recorded. Calibration graph was plotted using peak area ratios of ropinirole to internal standard peak areas versus concentrations of ropinirole. Twenty tablets of ropinirole were weighed and average weight was calculated. Quantity of powder equivalent to 10 mg was weighed accurately, dissolved and volume was made up to 100 ml with ethanol. This solution was filtered and further diluted to get requisite concentrations and analyzed as described under procedure for pure sample.

The developed methods were validated for parameters like accuracy, precision and stability. The regression equation and validation parameters are given in Table 2. Accuracy was established by performing recovery studies. These were carried out at 50 and 100% levels. Recovery values close to 100% indicates accuracy of method. For HPTLC method, limit of detection (LOD) and limit of quantification (LOQ) were found to be 12 and 40 µg/ml, respectively. Precision was studied under intra-day precision, inter-day precision and repeatability.

For all these parameters, % RSD values were found to be less than one which indicates that the developed methods have good precision. Stability studies were also carried out. Drug solutions were found to be stable for about 2 h at room temperature and the developed TLC plate was found to be stable for about 3 h.

The developed UV spectroscopic and HPTLC method are precise and accurate. From the two methods developed for the estimation of ropinirole, the HPTLC method was found to be more precise. However, both techniques can be applied for routine analysis of ropinirole from tablet dosage forms.

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Effect of Protective Coating of Aspirin Tablets with Acrylatemethacrylate Copolymers on Tablet Disintegration Times and Dissolution Rates

R. S. OKOR, E. EICHIE, M. U. UHUMWANGHO* AND A. P. AKA-AHA
Department of Pharmaceutics, Faculty of Pharmacy, University of Benin, Benin City, Nigeria.

Tablets of aspirin (a moisture degradable drug) have been film coated with two analogous Eudragit RL and RS copolymers designated here as A and B which differ only in their cation content in the ratio 2:1 (A:B). A, is therefore more hydrophilic than B. The tablets were film coated with ethanol solutions of these two polymers. Film coating with either A or B significantly reduced the moisture uptake potentials of the tablets but caused an increase in the disintegration times of the tablets and retarded dissolution rates. The mean disintegration times were 0.5±0.1 min (uncoated tablets), 16±2.5 min (tablets coated with A) and 115±3.6 min (tablets coated with B). The corresponding dissolution rates % h⁻¹ were 28.3 for uncoated, 16.6, coated with A and 14.8, coated with B, respectively. Thus, coating with polymer B considerably impaired the disintegration and dissolution properties of the tablets.

Key words: Eudragit copolymer, film coating of tablets, tablet disintegration time and dissolution rates

An important area of application of polymeric film coating of tablets is to protect against moisture degradation¹. Aspirin for instance is moisture degradable and therefore its tablets require protective coating. Polymer films for this area of application should have a high moisture resistance and should dissolve or swell and disrupt when in contact with aqueous fluids to allow disintegration and dissolution of the tablet, otherwise bioavailability will be compromised. A previous study² has indicated that film coating of tablets will invariably lead to increase in disintegration times.

The acrylatemethacrylates are water insoluble but swellable polymers. The presence of cationic (quaternary ammonium) groups in the polymer chemical structure confers the hydrophilic swelling property. Thus, the higher the cationic content the higher the porosity and permeability of resulting films³. The polymers have been investigated as binders in tabletting⁴, microencapsulation of drug particles for controlled release application⁵.

The present study investigates their applicability in protective coating of aspirin tablets against moisture degradation. Pursuant to this objective the water uptake potentials of the tablets, their disintegration times and dissolution rates were determined.