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Effect of Biofield Treatment on Spectral Properties of Paracetamol and Piroxicam

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Abstract

Paracetamol and piroxicam are non-steroidal anti-inflammatory drugs (NSAIDs), widely used in pain and inflammatory diseases. The present study aimed to evaluate the impact of biofield treatment on spectral properties of paracetamol and piroxicam. The study was performed in two groups (control and treatment) of each drug. The control groups remained as untreated, and biofield treatment was given to treatment groups. Subsequently, spectral properties of both drugs before and after biofield treatment were characterized using FT-IR and UV-Vis spectroscopic techniques. FT-IR data of paracetamol showed N-H amide II bending peak in biofield treated paracetamol, which was shifted to lower wavenumber (1565 to 1555 cm^{-1}) as compared to control. Further, the intensity of vibrational peaks in the range of 1171-965 cm^{-1} (C-O and C-N stretching) were increased in treated sample of paracetamol as compared to control. Similarly, the FT-IR data of piroxicam (treated) showed increased intensity of vibrational peaks at 1628 (amide C=O stretching), 1576-1560 cm^{-1} (C=C stretching) with respect to control peaks. Furthermore, vibrational peak of C=N stretching (1467 cm^{-1}) was observed in biofield treated piroxicam. This peak was not observed in control sample, possibly due to its low intensity. Based on FT-IR data, it is speculated that bond length and dipole moment of some bonds like N-H (amide), C-O, and C-N in paracetamol and C=O (amide), C=N, and C=C in piroxicam might be changed due to biofield treatment. The UV spectrum of biofield treated paracetamol showed the shifting in wavelength of UV absorption as 243→248.2 nm and 200→203.4 nm as compared to control. Likely, the lambda max (λ_{max}) of treated piroxicam was also shifted as 328 →345.6 nm, 241→252.2 nm, and 205.2→203.2 nm as compared to control. Overall results showed an impact of biofield treatment on the spectral properties of paracetamol and piroxicam.

Keywords: Paracetamol; Piroxicam; Biofield treatment; Fourier transform infrared spectroscopy; Ultraviolet spectroscopy

Introduction

Paracetamol [N-(4-Hydroxyphenyl) ethanamide] or acetaminophen (in United States) is an analgesic and antipyretic drug, widely used for pain (back and neck) and fever for approximately 50 years and has relatively few side effects [1,2]. However, it is ineffective in the pain originating from smooth muscle spasm in internal organs. Several guidelines published in Australia, New Zealand, and Europe consistently recommend the prescription of paracetamol for chronic low back pain [1,3]. Hence, it became one of the most popular and extensively used drug in the world for the treatment of pain and fever; especially for children. Initial literature report suggests that paracetamol acts through cyclooxygenases (COX) enzyme inhibition. In addition, a recent study showed a new mechanism of action *i.e.* indirect activation of cannabinoid CB_1 receptors in brain and spinal cord [2,4].

Piroxicam is N-heterocyclic carboxamide of 1,2 benzothiazine 1,1 dioxide. It is a member of the oxicam series of compounds and now well established for the treatment of osteoarthritis and rheumatoid arthritis as a better alternative to others drugs such as indomethacin, ibuprofen, aspirin, naproxen, sulindac, and diclofenac. It has an extended half-life of about 40 h, which enables it to be administered once daily [5,6]. Open clinical trials in thousands of patients (in hospital and in general practice) have shown its analgesic and anti-inflammatory efficacy in rheumatic diseases, musculoskeletal disorders, postoperative pain, and dysmenorrhoea. These studies also exhibited the good tolerability of piroxicam 20 mg daily with respect of gastrointestinal complaints that are most frequently reported side effects of other NSAIDs drugs. The gastrointestinal side effects have occurred less frequently with piroxicam than with therapeutically equivalent doses of indomethacin, aspirin, or phenylbutazone [6-8].

Chemical stability of pharmaceutical drugs or active ingredients is a matter of great concern as it affects the safety, efficacy, as well as long-term stability or shelf life of drugs or drug products [9]. Thus, it is important to evaluate an alternate strategy, which could enhance the stability of drugs by altering the structural and bonding properties of these compounds.

Contemporarily, biofield treatment is recognized as a new approach to alter the physical and structural properties at the atomic level of various living and non-living things [9-11]. The conversion of mass into energy is well known in literature for hundreds of years that was further explained by Hasenohrl and Einstein [12,13]. Meanwhile, Planck M give a hypothesis that energy is a property of matter or substances that neither can be created nor destroyed but can be transmitted to other substances by changing into different forms [14]. According to Maxwell JC, every dynamic process in the human body had an electrical significance [15]. Rivera-Ruiz et al. reported that human biofield could be measure by electrocardiography, which can be found using some medical technologies such as electromyography, electrocardiography, and electroencephalogram. This electromagnetic field of the human body is known as biofield and energy associated

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with this field is known as biofield energy [16,17]. A human has the ability to harness the energy from environment or universe and can transmit into any living or nonliving object around this Globe. The object(s) always receive the energy and responding into useful way, this process is known as biofield treatment.

Mr. Mahendra Kumar Trivedi's biofield treatment has considerably altered physicochemical and structural properties of metals and ceramics [11,18-20]. A recent study reported that growth, anatomical characteristics, and contents of secondary metabolites of ashwagandha were increased after biofield treatment [21]. Further, biofield treatment has significantly enhanced the yield, nutrient value, and quality of various agriculture products [22,23]. Moreover, the antimicrobial susceptibility, biochemical reactions pattern, and biotype of some pathogenic microbes have also changed after biofield treatment [10,24].

Considering these facts, the present study was aimed to evaluate the impact of biofield treatment on spectral property of paracetamol and piroxicam and its effects were analyzed at atomic level using Fourier transform infrared (FT-IR) and Ultraviolet-Visible (UV-Vis) spectroscopy.

Materials and Methods

Study design

The paracetamol and piroxicam (Figure 1) samples were procured from Sigma-Aldrich, MA, USA; and divided into two parts of each drug *i.e.* control and treatment. The control samples remained as untreated, and treatment samples were handed over in sealed pack to Mr. Trivedi for biofield treatment under laboratory condition. Mr. Trivedi provided this treatment through his energy transmission process to the treated groups without touching the sample. The control and treated samples of paracetamol and piroxicam were analyzed using FT-IR and UV-Vis spectroscopy.

FT-IR Spectroscopic characterization

FT-IR spectra were recorded on Shimadzu's Fourier transform infrared spectrometer (Japan) with frequency range of 4000-500 cm^{-1}. The FT-IR spectroscopic analysis of both control and treated samples of each drug (paracetamol and piroxicam) was carried out to evaluate the impact of biofield treatment at atomic level like bond strength (force constant) and stability of chemical structure.

UV-Vis Spectroscopic analysis

UV spectra of paracetamol and piroxicam were recorded on Shimadzu UV-2400 PC series spectrophotometer with 1 cm quartz cell and a slit width of 2.0 nm. The analysis was carried out using wavelength in the range of 200-400 nm. The analysis was performed to determine the effect of biofield treatment on structural property of tested drugs (paracetamol and piroxicam).

Results and Discussion

FT-IR spectroscopic analysis

The FT-IR spectra of both control and treated paracetamol are shown in (Figure 2). The spectrum of control sample of paracetamol (Figure 2a) showed characteristic vibrational peak for O-H and CH_3 stretching at 3326 and 3162-3035 cm^{-1}, respectively. Vibrational peaks at 1654 and 1610 cm^{-1} were assigned to C=O and C=C stretching, respectively. The N-H amide II bending appeared at 1565 cm^{-1}. Asymmetrical bending in C-H bond appeared at 1507 cm^{-1}, and C-C stretching peak was appeared at 1443-1437 cm^{-1}. The absorption peaks at 1368-1328 and 1260-1227 cm^{-1} were assigned to symmetrical bending in C-H and C-N (aryl) stretching. Further, absorption peaks at 1171 and 965 cm^{-1} were assigned to C-O stretching and C-N (amide) stretching, respectively. Vibrational peaks at 838 and 514 cm^{-1} were assigned to para-disubstituted aromatic ring and out of plane ring deformation of phenyl ring, respectively. The observed FT-IR data of paracetamol (control) was confirmed by the literature data [25].

The FT-IR spectrum of biofield treated paracetamol (Figure 2b) showed the vibrational peaks at 3325 and 3162-3035 cm^{-1}, which were assigned to O-H and CH_3 stretching, respectively. Vibrational peaks at 1653 and 1609 cm^{-1} were attributed to C=O (amide I) stretching and C=C stretching, respectively. Further, vibrational peaks at 1555, 1506, and 1437 cm^{-1} were assigned to N-H amide II bending, asymmetrical bending in C-H bend and C-C stretching, respectively. Absorption peaks at 1369-1328, 1259-1227, and 1171-1104 cm^{-1} were attributed to symmetrical bending in C-H bend, C-N (aryl) and C-O stretching, respectively. Vibrational peaks 965, 837, and 515 cm^{-1} were assigned to C-N (amide) stretching, para-disubstituted aromatic ring and out of plane ring deformation of phenyl ring, respectively.

Altogether, the FT-IR data of paracetamol (control and treated) suggested that N-H amide II bending peaks in biofield treated paracetamol was observed at lower wavenumber (1565→1555 cm^{-1}) as compared to control. The bending peak referred to alteration in rigidity of bonds. Reduction in wavenumber of bending peak (N-H amide II bending) might be referred to increase in flexibility of N-H bond. In addition, the intensity of vibrational peaks at 1171-965 cm^{-1} (C-O and C-N stretching) was increased in treated sample of paracetamol as compared to control. The intensity of vibrational peaks of particular bond depends on ratio of change in dipole moment ($\partial\mu$) to change in bond distance (∂r) *i.e.* the intensity is directly proportional to change in dipole moment and inversely proportional to change in bond distance [26]. Based on this, it is speculated that ratio of $\partial\mu/\partial r$ might alter in some bonds (appeared in the range of 1171-965 cm^{-1}) that could be due to influence of biofield treatment. Data showed the impact of biofield treatment at the atomic level of paracetamol as compared to control. The concentration and particle size of analytes can also affect the vibrational peak intensity, however these factors (concentration and particle size) affect to all corresponding vibrational peaks in analytes rather than a group or particular peak [27,28].

The FT-IR spectrum of piroxicam (control) is shown in (Figure 3a). The vibrational frequency at 3338 cm^{-1} was assigned to pyridin-2-yl-amino stretching. Vibrational peaks at 1628, 1575-1560, and 1531 cm^{-1} were attributed to amide C=O stretching, C=C stretching, and amide-II (N-H) bending, respectively. Absorption bands at 1436, 1351, and 1301 cm^{-1} were assigned to asymmetrical C-H bending, symmetrical C-H bending, and S=O asymmetric stretching, correspondingly. The C-C stretching and S=O symmetric stretching were appeared at 1216 and 1182 cm^{-1}, respectively. Further, vibrational peaks at 1150, 1119, and 1039-939 cm^{-1} were assigned to stretching of $-SO_2$-N- group, C-O stretching, and C-N stretching, respectively. Stretching of ortho-disubstituted phenyl was appeared at 775 cm^{-1}. The peaks at 732-691,

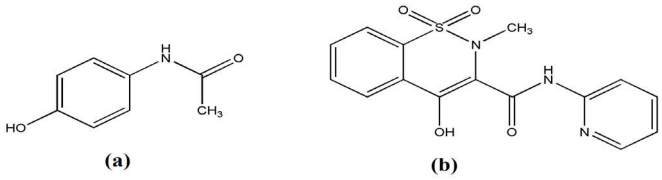

Figure 1: Chemical structure of (a) paracetamol and (b) piroxicam.

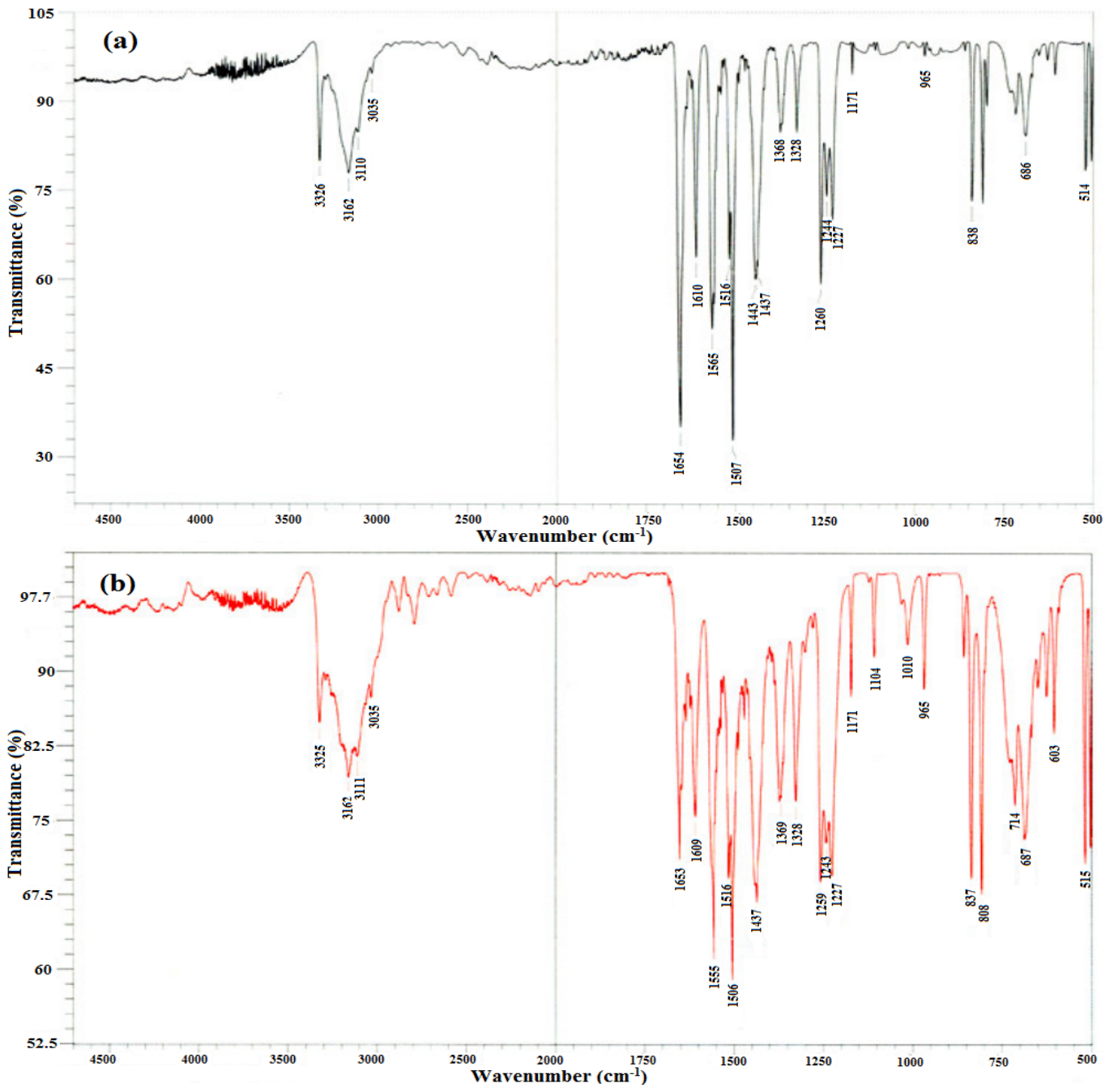

Figure 2: FT-IR spectra of paracetamol (a) control and (b) treated.

626, and 561-525 cm^{-1} were attributed to =C-H bending, C-S stretching, out of plane ring (phenyl ring) deformation, respectively. The FT-IR data of piroxicam were well supported by the literature data [29].

The FT-IR spectrum (Figure 3b) of biofield treated piroxicam showed the absorption bands at 3339 cm^{-1} that was assigned to pyridin-2-yl-amino stretching. Vibrational peaks at at 1628, 1576-1560, and 1534 cm^{-1} were attributed to amide C=O stretching, C=C stretching, and amide-II (N-H) bending, respectively. The IR absorption peak at 1507-1467 cm^{-1} was assigned to C=N stretching. Absorption bands at 1437, 1352, and 1302 cm^{-1} were assigned to asymmetrical C-H bending, symmetrical C-H bending, and S=O asymmetric stretching, respectively. Absorption peaks at 1216 and 1182 cm^{-1} were assigned to C-C and S=O symmetric stretching, respectively. Further, absorption bands at 1150, 1120, and 1039-939 cm^{-1} were assigned to stretching of $-SO_2$-N- group, C-O stretching, and C-N stretching, respectively. Ortho-disubstituted phenyl stretching was appeared at 773 cm^{-1}. Vibrational bands for =C-H bending, C-S stretching, and out of plane ring deformation were appeared at 732-691, 626, and 563-525 cm^{-1}, respectively.

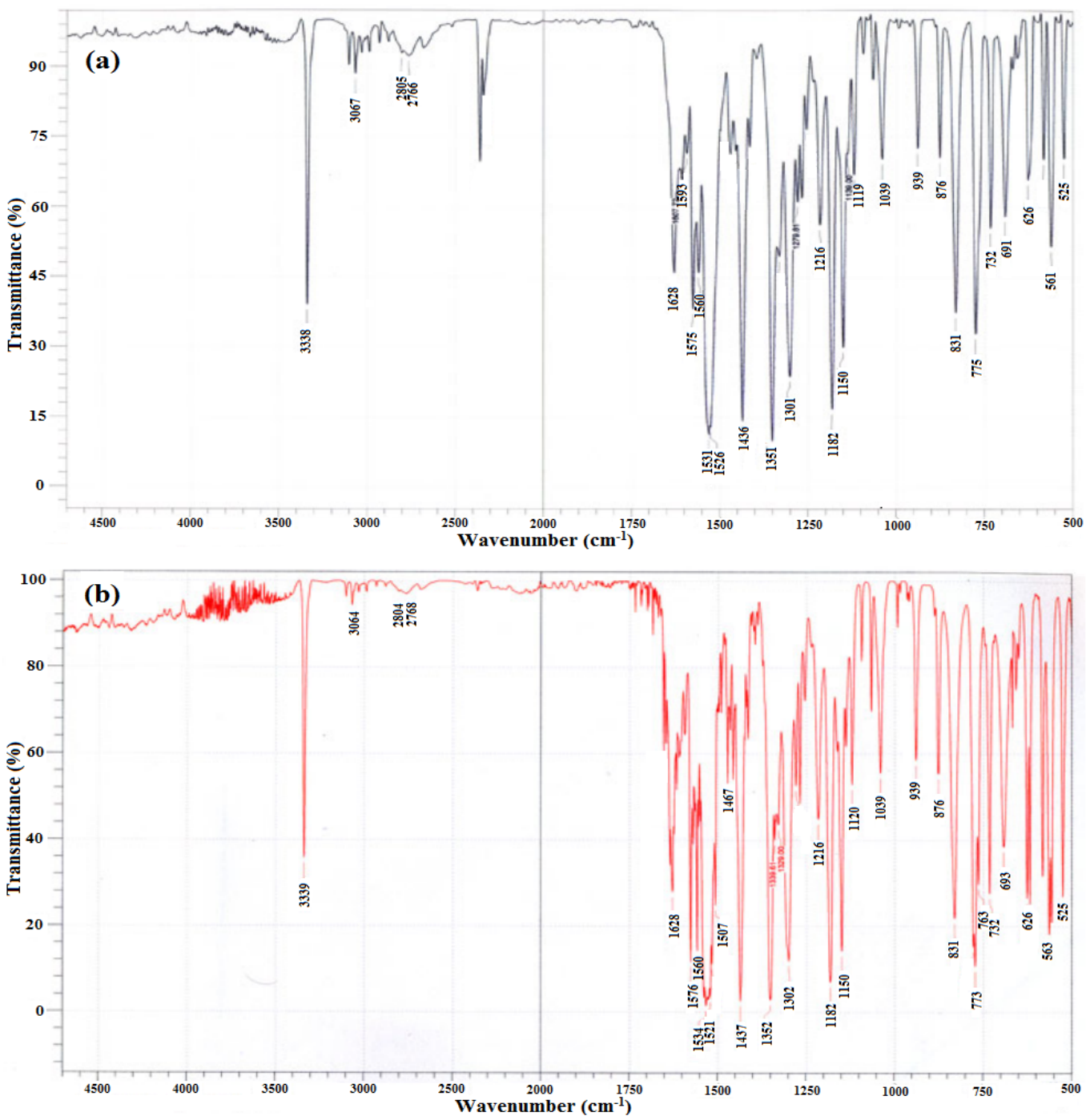

Figure 3: FT-IR spectra of piroxicam (a) control and (b) treated.

The FT-IR data of piroxicam (treated) showed the increase in the intensity of vibrational peaks at 1628 (amide C=O stretching), 1576-1560 cm^{-1} (C=C stretching) with respect to other peaks. It may be due to alteration in dipole moment of corresponding atoms after biofield treatment. This occurred possibly due to influence of biofield treatment on dipole moment and bond distance. Further, the vibrational peaks at 1467 cm^{-1} (C=N stretching) was observed in the FT-IR spectrum of biofield treated piroxicam. It is not seen in FT-IR spectra of control sample because it might be overlapped with other peaks or its intensity was very low to be detected. Based on this, it is postulated that biofield treatment may affect piroxicam at the atomic level and thereby changed the bond strength, flexibility or dipole moment of some bonds like amide C=O and, aromatic ring C=C, and C=N bonds as compared to control.

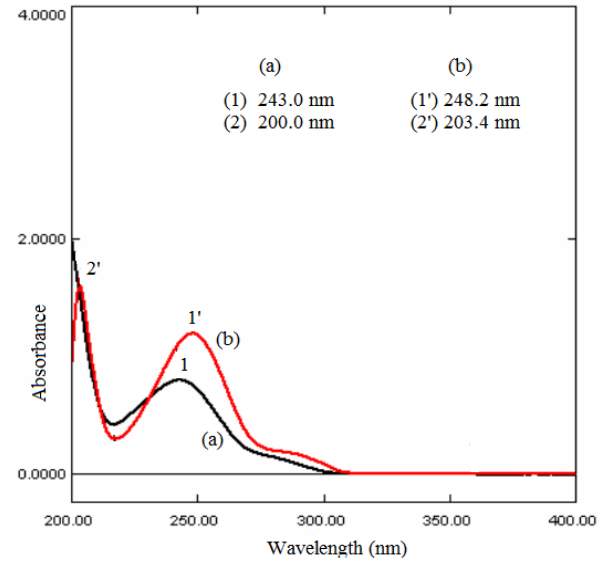

Figure 4: UV spectra of paracetamol (a) control and (b) treated.

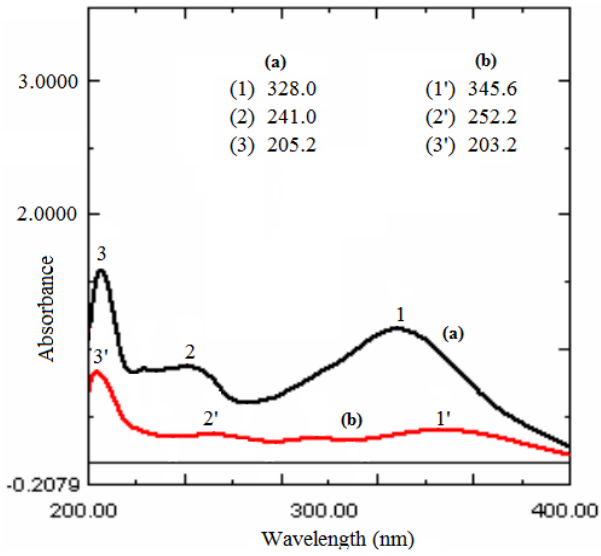

Figure 5: UV spectra of piroxicam (a) control and (b) treated.

UV-Vis spectroscopy

UV spectra of control and treated paracetamol are shown in Figure 4. The control sample of paracetamol showed two absorbance bands that were shifted to higher lambda max (λ_{max}) as 200.0 →203.4 nm and 243→248.2 nm as compared to control. Similarly, UV spectra of piroxicam (control and treated) is shown in Figure 5. The spectrum of treated piroxicam exhibited three UV absorption peaks, which shifted the wavelength (λ_{max}) like 205.2→203.2 nm, 241→252.2 nm, and 328→245.6 nm, as compared to control. This indicates a possible change in the chromophoric group of piroxicam due to the effect of biofield treatment, as compared to control. To the best of our knowledge, this is the first report showing an impact of biofield treatment on UV spectral property of paracetamol and piroxicam. Overall, the UV spectra results of both drugs showed a considerable change in the UV spectral property of tested drugs as compared to their control.

Conclusion

The FT-IR data showed an alteration in the wavenumber of N-H amide II bending, and in intensity of some vibrational peaks assigned to C-O and C-N stretching in biofield treated paracetamol; and C=O and C=C stretching in biofield treated piroxicam, as compared to their control. Further, the UV spectra of biofield treated paracetamol and piroxicam showed an alteration in the lambda max (λ_{max}) of absorption peaks with respect to their control.

Overall, the FT-IR and UV results showed an impact of biofield treatment on bonding property (force constant and dipole moment) and structural property of tested drugs, as compared to control. This might be occurred due to some possible alteration at the atomic level of tested drugs through biofield treatment.

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References

1. Davies RA, Maher CG, Hancock MJ (2008) A systematic review of paracetamol for non-specific low back pain. Eur Spine J 17: 1423-1430.
2. Bertolini A, Ferrari A, Ottani A, Guerzoni S, Tacchi R, et al. (2006) Paracetamol: new vistas of an old drug. CNS Drug Rev 12: 250-275.
3. Koes BW, van Tulder MW, Ostelo R, Kim Burton A, Waddell G (2001) Clinical guidelines for the management of low back pain in primary care: an international comparison. Spine (Phila Pa 1976) 26: 2504-2513.
4. Ottani A, Leone S, Sandrini M, Ferrari A, Bertolini A (2006) The analgesic activity of paracetamol is prevented by the blockade of cannabinoid CB1 receptors. Eur J Pharmacol 531: 280-281.
5. Brogden RN, Heel RC, Speight TM, Avery GS (1981) Piroxicam: a review of its pharmacological properties and therapeutic efficacy. Drugs 22: 165-187.
6. Ando GA, Lombardino JG (1983) Piroxicam--a literature review of new results from laboratory and clinical studies. Eur J Rheumatol Inflamm 6: 3-23.
7. Edwards JE, Loke YK, Moore RA, McQuay HJ (2000) Single dose piroxicam for acute postoperative pain. Cochrane Database Syst Rev : CD002762.
8. Scarpignato C (2013) Piroxicam- β -cyclodextrin: a GI safer piroxicam. Curr Med Chem 20: 2415-2437.
9. Blessy M, Patel RD, Prajapati PN, Agrawal YK (2014) Development of forced degradation and stability indicating studies of drugs-A review. J Pharm Anal 4: 159-165.
10. Trivedi MK, Patil S (2008) Impact of an external energy on Yersinia enterocolitica [ATCC-23715] in relation to antibiotic susceptibility and biochemical reactions: an experimental study. Internet J Alternat Med 6.
11. Trivedi MK, Patil S, Tallapragada PMR (2015) Effect of biofield treatment on the physical and thermal characteristics of aluminium powders. Ind Eng Manage 4: 151.
12. Hasenohrl F (1904) On the theory of radiation in moving bodies. Ann Phys 320: 344-370.
13. Einstein A (1905) Does the inertia of a body depend upon its energy-content? Ann Phys 18: 639-641
14. Planck M (1903) Treatise on thermodynamics (3rd edn), English translated by Alexander OGG, Longmans, Green, London (UK).
15. Maxwell JC (1865) A dynamical theory of the electromagnetic field. Phil Trans R Soc Lond 155: 459-512.
16. Rivera-Ruiz M, Cajavilca C, Varon J (2008) Einthoven's string galvanometer: the first electrocardiograph. Tex Heart Inst J 35: 174-178.
17. Rubik B (2002) The biofield hypothesis: its biophysical basis and role in medicine. J Altern Complement Med 8: 703-717.
18. Trivedi MK, Tallapragada RR (2008) A transcendental to changing metal powder characteristics. Met Powder Rep 63: 22-28, 31.

19. Trivedi MK, Nayak G, Patil S, Tallapragada RM, Latiyal O (2015) Studies of the atomic and crystalline Characteristics of ceramic oxide nano powders after biofield treatment. Ind Eng Manage 4: 1000161

20. Trivedi MK, Patil S, Tallapragada RM (2014) Atomic, crystalline and powder characteristics of treated zirconia and silica powders. J Material Sci Eng 3: 144.

21. Altekar N, Nayak G (2015) Effect of biofield treatment on plant growth and adaptation. J Environ Health Sci 1: 1-9.

22. Sances F, Flora E, Patil S, Spence A, Shinde V (2013) Impact of biofield treatment on ginseng and organic blueberry yield. Agrivita J Agric Sci 35.

23. Shinde V, Sances F, Patil S, Spence A (2012) Impact of Biofield treatment on growth and yield of lettuce and tomato. Aust J Basic Appl Sci 6: 100-105.

24. Trivedi MK, Bhardwaj Y, Patil S, Shettigar H, Bulbule A (2009) Impact of an external energy on Enterococcus faecalis [ATCC-51299] in relation to antibiotic susceptibility and biochemical reactions-an experimental study. J Accord Integr Med 5: 119-130.

25. Bashpa P, Bijudas K, Tom AM, Archana PK, Murshida KP, et al. (2014) Polymorphism of paracetamol: A comparative study on commercial paracetamol samples. Int J Chem Studies 1: 25-29.

26. Smith BC (1999) Infrared Spectral Interpretation: A systematic approach. CRC Press.

27. Duyckaerts G (1959) The infra-red analysis of solid substances. A review. Analyst 84: 201-214.

28. Pavia DL, Lampman GM, Kriz GS (2001) Introduction to spectroscopy. (3rdedn), Thomson learning, Singapore.

29. Varma V, Sowmya C, Tabasum SG (2012) Formulation and evaluation of piroxicam solid dispersion with suitable carrier. Res J Pharm Biol Chem 3: 929-940.