



## Psychotropic Drugs and Skin: An Association

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### ABSTRACT

**Background:** Psychodermatology is an established branch of psychosomatics. The vast knowledge in the field of psychosomatics has also opened the door for the discussion of the dermatological side effects of psychotropic drugs. Various psychotropic drugs are found associated with skin side effects. In this review article, we highlighted some common psychotropic drugs that lead to skin damage.

**Method:** Literature search in various databases and journals were conducted.

**Result:** Drugs like Haloperidol, Clozapine, Asenapine, Quetiapine, Lithium, Risperidone, Cyamemazine are practically responsible for skin eruptions and lesions like, rash, alopecia areata, angioneurotic edema, pityriasis-rosea like drug reaction, acute generalized exanthematous pustulosis, acne, giant urticaria, rash and desquamation, symmetrical drug-related intertriginous and flexural exanthema, photoallergic reactions.

**Conclusion:** Almost all of these side-effects were reversible when the drug was discontinued or replaced. By studying the association of the side-effects of different psychotropic medications with the human skin, we concluded that more significance should be given to the patch- tests before prescribing any anti-psychotic drug so, that allergic reaction can be avoided. We suggest more study and searches on this subject to spread awareness among healthcare professionals and patients to produce even better-working antipsychotics medications in the coming future.

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#### 1. Introduction:

Since the universal acceptance of psychiatry as an important branch of medical sciences, it has been found to be associated with different specialties as a comorbidity. It is also not uncommon to see psychiatric patients in the wards specifically dedicated to other medical disciplines (Tohid, 2015;

Tohid & Ashraf, 2016). Multiple drugs have been introduced to treat psychiatric patients that are classified as Antidepressants, Stimulants, Antipsychotics, Mood stabilizers, Anxiolytics, Depressants and, Psychedelic drugs. All of these drugs have their own effects along with their side effects.



Psychiatric medications are among the most widely prescribed medications in the United States. Patients prescribed with psychiatric medications (psychotropic medications) are often affected by adverse cutaneous drug reactions (Lange-Asschenfeldt et al., 2009; Lamer et al., 2010; Mitkov et al., 2014).

Because brain and the integumentary system have an association (Tohid et al., 2016), it is quite logical to understand that skin disorders and brain disorders have an association. Similarly, psychotropic drugs leading to cutaneous reactions is not a surprise either. Usually, 2% to 3 % patients on psychiatric drugs show adverse skin reactions. Most adverse cutaneous drug reactions associated with psychotropic medications are benign and easily treated, however, some can be severe and life-threatening. These adverse cutaneous drug reactions are commonly associated with antidepressants, antipsychotics, and mood stabilizers (Bliss & Warnock, 2013).

These adverse drug reactions (ADRs) also account for 3-6% of all hospitalizations, accounting for 5% to 9% of hospital admission costs. Skin is often involved in ADRs and although most cutaneous ADRs have good prognosis, they may present as Severe Adverse Cutaneous Drug Reactions (SCARs), such as Toxic Epidermal Necrolysis (TEN), Stevens-Johnson syndrome (SJS), drug-induced hypersensitivity syndrome (drug reactions with eosinophilia), and acute generalized exanthematous pustulosis (Borroni, 2014). Most of the cutaneous ADRs are not life-threatening, however, they can cause poor quality of life especially among the elderly (Carneiro et al., 2011). Serious consequences of SJS and TEN are a high mortality rate of 20%–25%, and long-lasting sequelae including corneal ulcerations (Rzany et al., 1996). Additionally, the mortality in SJS and TEN patients increased with age (Fouchard et al., 2000). Moreover, in-hospital mortality and after-discharge deaths were associated with older age in patients with SCARs (Sekula et al., 2013). A couple of cases of bullous skin lesions and paresis the following coma due to the ingestion of many antipsychotic drugs have been reported. Histological examination showed an intraepidermal blister in SJS and degeneration of sweat glands in both SJS and TEN. An immunofluorescence study showed massive deposits of IgM and C3 in the dermal vessels (Taniguchi et al., 1990).

When a severe cutaneous reaction develops, the suspected causal agent should be immediately withdrawn. Hypersensitivity reactions like lichenoid drug eruptions are usually symmetrical on the trunk, extremities, and trunk. These kinds of reactions are commonly seen after using various psychotropic

including phenothiazine antipsychotics. However, most of these reactions are relatively benign and easily treated (Kimyai-Asadi et al., 1999). The onset is within a few days of ingestion, affects any part of the body, and may involve the mucosal membranes (Valeyré-Allanore et al., 2007). Severe cutaneous eruptions, such as Erythema Multiforme, have been reported much less frequently with several atypical and some typical antipsychotics (Warnock & Morris, 2002a). This may lead to more serious reactions such as Stevens–Johnson Syndrome (SJS) or Toxic Epidermal Necrolysis (TEN) (Warnock & Morris, 2002b). The onset is slower, typically 1–3 weeks after initiation (Svensson et al., 2001).

Several psychotropic and neurotropic agents are useful in treating patients with skin diseases such as obsessive compulsive skin manipulation, delusions of parasitosis, generalized pruritus, and post-herpetic neuralgia. The mechanism of action of these agents is based on their interaction with central and peripheral neuronal receptors (Tennyson & Levine, 2001). TEN is an acute life-threatening disease characterized by involvement of the skin, multiple mucous membranes and internal organs. It is most commonly precipitated by the administration of drugs like anticonvulsants. Neuroleptic Malignant Syndrome (NMS) is a rare complication of neuroleptic therapy characterized by catatonic behavior, generalized muscular rigidity, hyperthermia and autonomic dysfunction (Muhammed & Raman, 2005).

Lipid-soluble psychotropic drugs are often used to treat skin diseases with psychosomatic indications. Although these drugs are known to exert their effects through the central nervous system, relatively little is known about their mechanism of action on the skin. In this regard, several lipid-soluble psychotropic drugs have been examined for their ability to inhibit protein kinase C (PKC)-catalyzed phosphorylation of exogenous substrates and endogenous skin proteins. Phosphorylation of three discrete skin protein substrates at 64, 42 and 28 kDa and a group crowded together at 15-18 kDa was inhibited by the antidepressants and antipsychotics. Inhibition was more pronounced in a phospholipid (PL) dependent system, but both drug-PL and drug-PKC interactions seem to be important in the mechanism of action of these drugs. In addition to the tricyclic nucleus, the propanamine side chain or its N-methyl form may influence the interaction of these drugs with PKC and its substrate(s). Chlorpromazine, imipramine, fluoxetine, doxepin, amitriptyline and hydroxyzine used in the practice of dermatology may exert their therapeutic effects by modulating skin PKC activity (Vaitla et al., 1997).

In this article, we will highlight those side-effects of psychiatric drugs which can affect the



physiology of the human skin, and can produce serious dermatological hazards if neglected at early stages or not treated at all.

## 2. Dermatological Side-Effects of Anti-Psychotic Medications:

### 2.1. Typical Anti-Psychotic:

#### 2.1.1. Haloperidol:

Schizophrenia and other mental problems which affect the way a person thinks, feels or behaves impact the lives of millions of people in the world. These conditions can make a person hear, see or sense things that are not there, believe things that are not true or have an irrational distrust of others. The antipsychotic medicine Haloperidol is used to treat the symptoms of these mental disorders. Studies suggest that Haloperidol can increase the skin's sensitivity towards sunlight causing photosensitive dermatitis (Thami et al., 2002). It may also cause a skin rash that might become severe, in which case requires immediate discussion with a physician (Allen, 2013).

Kubota et al. presented a case in 1994, in which a patient was prescribed Amoxapine 150mg/day and Haloperidol 5mg/day as a treatment of his suicidal thoughts and depression. One month after this treatment it was found out that the patient started to suffer from alopecia on the back of his head which remained unchanged on dermatological treatment. But this hair loss stopped only a week after Haloperidol was discontinued and later the hair started to regrow. In this case, it was suggested that the antipsychotic medication Haloperidol is associated with alopecia areata (Kubota et al., 1994).

Almirall et al. studied the effect of D-limonene, alpha-pinene and Cineole on in vitro transdermal human skin penetration of chlorpromazine and haloperidol and found that Cineole and D-limonene increased the permeation profile of Haloperidol, giving enhancement index (EI) values of 1.95 and 4.21 (Almirall et al., 1996). These kinds of studies, we believe, can provide a better understanding to improve the dermal side effects of haloperidol and other antipsychotic medications.

#### 2.1.2. Chlorpromazine:

Chlorpromazine, a non-tetracycline photo toxin, has been shown to cause skin problems. (Monteagudo-Paz et al., 2011).

Niczyporuk et al. conducted a study. The goal of the study was to make a selection of the calmodulin blockers, which could be useful in the topical treatment of psoriasis. They assessed four drugs: chlorpromazine, trifluoperazine, miconazole and ketoconazole. These drugs were applied on the skin of guinea pigs, twice a day for a period of two weeks.

Biopsy samples were then taken for light microscopy, histo- enzymatic examination and for evaluation of the proliferation activity of the epidermis. A decrease in reaction activities for lactate dehydrogenase and succinic dehydrogenase as well as in the proliferation activity of the epidermis was seen (Niczyporuk et al., 1995).

It could suggest an inhibitory effect of chlorpromazine and miconazole on the cell cycle and keratinization process (Niczyporuk et al., 1995). Moreover, chlorpromazine can also cause pustular eruptions (Burrows et al., 1994). In the study conducted by Kammeyer et al. Chlorpromazine, an inhibitor of the complement (C) system, was found to inhibit the cellular infiltration at the site of Arthus reaction (AR) as assessed by a newly developed computerized area integration technique (CAIT). This inhibition was strong (mean value 92%) and statistically significant according to the classical quotient estimator. This could explain the protection of vessel wall destruction by chlorpromazine in AR. CAIT estimated cellular infiltration in H & E stained skin biopsy sections quantitatively and reliably (Kammeyer et al., 1990).

Furthermore, Mischer et al. tested 150 patients with a light sensitivity of unknown etiology with photo patch. 22 patients showed photoallergy. The identified photo allergens were mostly halogenated salicylanilides and other phenolic compounds. These substances are used as antimicrobials in soaps and cosmetics and as antimycotics in dermatological preparations. Four of the patients showed allergic contact photosensitivity to chlorpromazine. In two patients a new photo allergen has perhaps been discovered, namely a derivative of phthalic acid which is employed as a fungicidal pesticide. The problems and consequences of photoallergy are discussed (Mischer et al., 1977).

Since the discovery of chlorpromazine in 1953, the dermatological side effects have been studied in depth. GRE et al studied that Ocular and dermatologic complications of prolonged chlorpromazine therapy had been noted in 70 patients of a series of many thousands receiving similar therapy. All affected patients were women who had been receiving high doses of chlorpromazine, averaging 500 to 1500 mg. daily for at least three to five years before the complications were seen. Skin manifestations consisted of a peculiar purplish pigmentation of the skin of exposed areas of the face, neck and hands characterized histologically by deposition of material with the staining properties of melanin in the superficial layers of the dermis, particularly in a perivascular distribution. Ocular complications consisted of granular opacity of the cornea and often of the lens as well, the latter producing a central



stellate type of cataract (Greiner et al., 1964). Later, Blue-gray pigmentation of the skin as well as corneal and lens opacities has been seen in patients who were treated with chlorpromazine for a period of years by several other researchers (Huff et al., 2014).

#### 2.1.3. Cyamemazine: Photoallergic Reaction:

According to the Dermatology Online Journal, a case was reported in which a 50-year-old man with a history of chronic alcohol abuse who has been treated with Cyamemazine, Risperidone, Alprazolam, complained of severe pruritus with marked erythema of the face, neck, and upper chest. These side-effects were later relieved upon discontinuation of the Cyamemazine medication. The patient showed positive patch tests to Cyamemazine, a biopsy was performed and based on the clinical and histological findings it was diagnosed as a photoallergic reaction to Cyamemazine (Fernandes et al., 2013).

The mechanisms of the phototoxic response induced by cyamemazine in cultured fibroblasts and keratinocytes were also described by Morlière et al. who found that keratinocytes were an order of magnitude less sensitive to the photosensitized lipid peroxidation than fibroblasts. Microspectrofluorometry revealed that lysosomal membranes were major sites of Cyamemazine incorporation into the two cell lines because a Förster-type resonance energy transfer process occurs from Cyamemazine to LysoTracker Red DND99 (LTR), a specific fluorescent probe of lysosomal membranes. The Cyamemazine-photosensitized destruction of LTR demonstrated that the drug retained its photosensitizing capacity after its lysosomal uptake (Morlière et al., 2004).

## 2.2. Atypical Anti-Psychotic:

### 2.2.1. Olanzapine

Olanzapine also affects the skin as it is found to be associated with skin rash in many patients (Solfanelli et al., 2013). Pustular eruption is also witnessed with olanzapine use (Adams & Mutasim, 1999). Olanzapine-induced eccrine squamous syringometaplasia is a rare but a possible skin problem associated with olanzapine use. (Molina-Ruiz et al., 2012) Moreover, olanzapine is also associated with occupational allergic contact dermatitis (Lowney et al., 2010)

Photo-onycholysis associated with drugs is an uncommon disorder. A case of a woman who developed photo-onycholysis on multiple nails after uptake of olanzapine has been reported by Gregoriou et al. They observed that substitution of olanzapine with aripiprazole further exacerbated the problem (Gregoriou et al., 2008).

### 2.2.2. Aripiprazole

Lichenoid drug reaction to aripiprazole, a severe and potentially life-threatening adverse cutaneous reaction that required medical and surgical intervention was observed by Parker (Parker, 2012). Shen et al. reported three severe adverse cutaneous reactions in people using aripiprazole with lamotrigine. This combination therapy increases the risk of Stevens-Johnson syndrome (Shen et al., 2007).

### 2.2.3. Clozapine

Prescribed anti-psychotics can cause cutaneous rashes, lesions, and eruptions which may vary in the severity and forms. Most of these reactions caused are mild; however, some may become very complicated if not treated on time. Some of the most severe cases reported are of Angioneurotic edema, exanthematous reactions, Stevens-Johnson syndrome and toxic epidermal necrolysis.

According to Mishra et al. two cases have been reported in which patients taking Clozapine developed Classical Angioneurotic Edema and the symptoms were rapidly improved when the clozapine therapy was discontinued. (Osman et al., 2014; Mishra et al., 2007).

Another case was published on 20th April 2012 in General Hospital Psychiatry Journal, which reported that a 54-year-old man with chronic schizophrenia was being treated with Clozapine for 28 days after which he developed serious skin rashes, fever, and abnormal LFTs. In this case, Clozapine was immediately discontinued and symptoms were relieved with treatment with anti-histamines and steroids (Lai et al., 2012).

Moreover, toxic hepatitis with dermatological rash and cutaneous vasoconstriction have also been seen by the use of clozapine (Fong et al., 2005; Blessing, 2004).

### 2.2.4. Asenapine: Pityriasis Rosea-Like Drug Reaction

A study was conducted by Makdisi et al. in which it was reported that a 30-year-old woman who was prescribed with 5 mg of Asenapine twice a day, developed Pityriasis rosea like drug reaction which was initially treated by methylprednisolone and topical steroids but the eruptions persisted for more than a week due to which Asenapine was discontinued. In this case, the first biopsy revealed spongiosis and parakeratosis (Features consistent with PR), and the second biopsy exhibited more characteristics of a drug reaction. It was concluded that the eruptions arose shortly after the initiation of Asenapine and this was the first reported case of Asenapine-induced reaction (Makdisi et al 2013).



### 2.2.5. Risperidone Oral

A case was presented in which a 37-year-old person with Bipolar Disorder I was initially treated with 2mg of Risperidone oral solution at bedtime along with calculated doses of Lithium, Diazepam, Zolpidem, and procyclidine.

On the 3rd day of treatment the patient complained of facial flushing, rash and desquamation which were progressively increasing to the face and neck with time, to avoid the adverse reaction Risperidone oral solution was replaced with 150mg/day of Quetiapine and it was observed that the skin lesions completely disappeared just after one day of the drug replacement. Lithium was maintained throughout the treatment. The study suggested that Quetiapine was a good alternative to Risperidone oral solution in order to avoid any adverse skin reactions in psychotic patients. (Chae et al., 2008).

Akay and Sanli published an article in *Pediatric Dermatology Journal*, 2009. The article reported the case of an 8-year-old boy who was on treatment with Risperidone oral solution for Attention Deficiency with Hyperactivity, developed skin eruption, the clinical findings were compatible with symmetrical drug-related intertriginous and flexural exanthema, also called Baboon syndrome. This case was said to be the first case associated with the Risperidone oral solution (Akay & Sanli., 2009). Moreover, self-limiting erythema multiforme has been observed in some patients due to the use of risperidone (Burke et al., 2009).

In October 2007, *British Journal of Clinical Pharmacology* reported a case of a 46-year-old male patient diagnosed with schizophrenia, prescribed Risperidone. The patient had a history of poor response to the other antipsychotic drugs except for Risperidone. Within 3 days of treatment with Risperidone the patient developed erythematous pruritic and painful rash, diagnosed as giant urticaria. Risperidone was stopped, resolving the symptoms. A re-challenge with Risperidone was done due to patient's poor response to the other drugs but the patient again started showing symptoms of giant urticaria that lead to discontinuation of the drug. This study highlighted the potential complication of the allergic form of urticaria due to Risperidone (Mishra et al., 2007).

### 2.2.6. Quetiapine

A case was presented in the journal, *Psychiatria Danubina* in 2013, where a 53-year-old female was admitted to the hospital for the treatment of generalized skin erythematous and pruritic papulopustular. The patient had mild mental retardation for the past 15 years and has been in psychiatric treatment. She had been treated with

clozapine for the past one week after which clozapine was substituted with quetiapine. A week after the treatment with quetiapine, erythematous macules with partial conflation and exfoliated areas appeared throughout the body. The patient had no history of somatic disorders. Histopathological findings reported this case as the first known case of clinically-consistent and histologically proven acute generalized exanthematous pustulosis overlap induced by quetiapine (Lasić et al., 2013).

### 2.3. Mood Stabilizers:

#### 2.3.1. lithium Acne

*Canadian Medical Association Journal* reported in 2013 the case of a female patient with bipolar disorder who developed severe eruption of cysts, papules and nodules on her face during the treatment with Lithium Carbonate. She had no history of acne or dermatological diseases.

Lithium-related acne was diagnosed and lithium was replaced by an alternative drug, the Acneiform Eruption had improved within 6 months and completely resolved later (Scarfi & Arunachalam, 2013).

#### 2.3.2. Carbamazepine and Others

Antiepileptic drugs are prescribed for the treatment of diverse conditions including migraines, mood disorders, neuropathic pain, and epilepsy (Hollingworth & Eadie, 2010). The Severe cutaneous adverse drug reactions (SCAR) risk is found to be highest in patients treated with carbamazepine as compared to other anti-epileptic drugs. However, carbamazepine is not solely an epileptic drug, it is frequently used in a psychiatric setting as a mood stabilizer.

According to one study, Carbamazepine use is associated with a nearly 10-fold increase in severe cutaneous drug reactions in Korean elderly patients. This association was consistently high with SCAR patients who received carbamazepine for neuropathic pain. Severe Cutaneous Adverse Drug Reactions (SCARs) such as Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) were also commonly seen in patients receiving carbamazepine (Yang et al., 2011).

In 2008, one study using the database from Taiwan National Health Insurance showed that the use of carbamazepine and valproate as mood stabilizers increased the risk of SCARs (carbamazepine: adjusted OR = 3.10, 95% CI: 1.51–6.35; valproate: adjusted OR = 5.17, 95% CI: 1.26–5.92). In Taiwan, Gau et al. investigated patients with bipolar disorder only, and the mean age of the subjects was 41 years (Gau et al., 2008)



According to the SCAR and EuroSCAR studies conducted in European countries, the Multivariate Relative Risk (MRR) of carbamazepine was 12 (95% CI 3.5–38) and 72 (95% CI: 23–225), respectively (Roujeau et al., 1995; Mockenhaupt et al., 2008) Besides carbamazepine, lamotrigine, topiramate, phenobarbital, phenytoin, and valproate are also associated with skin damage (Gau et al., 2008; Nanau & Neuman, 2013).

Furthermore, a meta-analysis by Grover & Kukreti, showed the presence of HLA alleles contributing toward risk of as well as protection against various CBZ-induced cADRs (Grover & Kukreti, 2014).

## 2.4. Tranquilizer

### 2.4.1. Phenothiazines and Its Derivatives

Phenothiazines can be given to a serious and sometimes irreversible dermatological and side effects. These effects can take the form of photosensitivity, grey-purple discoloration and hyperpigmentation of the skin and hyperpigmentation of the conjunctiva, cornea, lens, retina, choroidea and macula. Involvement of the retina or macula can lead to impaired vision, blurred vision, disturbed color perception and night blindness. Annual ophthalmic monitoring of patients receiving long-term treatment with Phenothiazines is suggested to avoid the dermatological side-effects of this drug (Wennersten et al., 1984).

## 2.5. Other Psychiatric Drugs

Perphenazine is also found to be dangerous to the skin (Gacías et al., 2013)

Thioridazine is a phenothiazine derivative that has been used as an antipsychotic; it rarely causes photosensitization. However, we noticed that this drug-induced an erythematous reaction in a photo patch test. Six volunteers were patch tested with various concentrations of Thioridazine and irradiated with a range of UVA doses, and the time courses of the color of, and blood flow to the test sites were monitored. The free-radical metabolites of Thioridazine generated under UVA irradiation and its effects on ascorbate radical formation were examined with an Electron Paramagnetic Resonance (EPR) spectrometer in vitro. As a result, immediate erythema developed during UVA irradiation in most subjects when 1% Thioridazine was applied for 48 h and irradiation doses were higher than 4 J cm<sup>-2</sup>. Another peak of the erythematous reaction was observed 8-12 h after irradiation. The in vitro examination detected an apparent EPR signal, which appeared when 2 mM Thioridazine in air-saturated phosphate buffer was irradiated with UVA, whereas this reaction was attenuated under anaerobic

conditions. The EPR signal of the ascorbate radical was augmented under both aerobic and anaerobic conditions. Thioridazine-derived oxidants and/or Thioridazine radicals generated during UVA irradiation seem to play an important role in this unique phototoxic reaction. (Takiwaki et al., 2006).

A study was conducted by Makdisi et al. reported that a 30-year-old woman who was prescribed with 5mg of Asenapine twice a day, developed Pityriasis rosea-like drug reaction which was initially treated by methylprednisolone and topical steroids but the eruptions persisted for more than a week due to which Asenapine was discontinued. In this case, the biopsy revealed spongiosis and parakeratosis (Features consistent with PR), and the second biopsy exhibited more characteristics of a drug reaction. It was concluded that the eruptions arose shortly after the initiation of Asenapine and this was the first reported case of Asenapine-induced reaction (Makdisi et al., 2013).

A case of a pyoderma gangrenosum (PG)-like eruption due to the antipsychotic drug sulpiride, a form of risperidone, is described. The contribution of sulpiride to the etiology of the pyoderma gangrenosum-like lesion is based on the observation of the reduction and healing of the ulcer upon cessation of the drug, and the formation of a bulla following the drug's re-administration. The literature on drug-induced pyoderma gangrenosum or pyoderma gangrenosum-like eruptions is discussed. The selectivity of sulpiride for dopamine receptors and its limited effect on other neuronal pathways differentiates sulpiride from other types of antipsychotic drugs commonly used in Israel, including phenothiazine, butyrophenone, and thioxanthene. Adverse systemic and cutaneous reactions to sulpiride and to risperidone are described. To our knowledge, this is the first report of a pyoderma gangrenosum-like eruption due to the former (Srebrnik et al., 2001). Ziprasidone is another antipsychotic medication which is known to affect the human or animal skin (Kim et al., 2014).

## 3. Conclusion:

With the notable increase in the use of psychotropic medications, the incidence of the associated side effects has increased. We know for sure that these medications are life-savers, alleviating the symptoms of psychotics and depressed and improving their quality of life. However, we also know for a fact that it is the fate of every medication have some side-effects on the human body, psychotropic medications being no exception. Some of the side effects of psychotropic medications are non-serious and can disappear with the reduction in

dose or discontinuation of the drug, while some side-effects are serious and can cause permanent damage.

The side-effects of these medications have been widely studied and well documented. They include drowsiness, agitation, urinary hesitancy, dry mouth, increased weight, stuffy nose, emotional blunting, muscle stiffness or spasms, constipation, diabetes, effects on movement, sedation, decreased sex drive, irregular periods in women, abnormal discharge from breasts, excessive salivation, skin rashes.

All of the above-mentioned side effects can adversely affect a person's lifestyle making it difficult for a psychotic patient to adhere to the therapy, leading to incomplete treatment of his/her illness.

Dermatological side-effects play an important role in depressing an already depressed or psychotic patient, which may lead to non-compliance, making his life difficult. Our study includes articles and reports of some patients who experienced serious and non-serious dermatological side-effects which resolved after the discontinuation of the drug or replacement of the drug with an alternative. Thus, by studying the association between the side-effects of different psychotropic medications on the human skin, we concluded that more emphasis should be given to the patch- tests before prescribing any psychotropic drug, so that adverse allergic reactions can be avoided. We suggest that further study and research on this subject be conducted and awareness spread among healthcare professionals so that we can produce even better working psychotropic medications in the future.

#### 4. Conflict of Interest

The authors declared None.

#### 5. Financial Source

The authors declare none.

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