International Journal of Pharmaceutical Science Invention
ISSN (Online): 2319 – 6718, ISSN (Print): 2319 – 670X
www.ijpsi.org Volume 7 Issue 3 ǁ March 2018 ǁ PP.13-15

Schizophrenia and Its Treatment: An Overview

Umesh Kumar[1,*], Pavan Kumar Gautam[2], Naveen Khatak[3],Seema Kumari[4]
[1]*Department of Zoology,Government College, Bhiwani-127021*
[2]*Department of Applied Sciences, Indian Institute of Information Technology Allahabad, Allahabad-211012*
[3]*Department of Zoology,Vaish P.G. College, Bhiwani-127021*
[4]*Department of Zoology, Dronacharya Government College, Gurugram-122001*
*,*Corresponding author. Umesh Kumar*

ABSTRACT: *We discuss the schizophrenia disease and possible model to understand precise mechanism of antipsychotic drugs. The symptoms of schizophrenia disorder have three major categories: positive, negative and cognitive Positive symptoms include auditory and visual hallucinations, delusions, conceptual disorganization and thought disorder. Negative symptoms are associated with emotional blunting, social withdrawal, anhedonia, avolition, poverty of thought and content of speech. While, cognitive symptoms include impaired executive function, working memory and attention. Available antipsychotic are divided in to two categories i.e., first generation antipsychotic drugs (typical antipsychotic drugs) and second generation antipsychotic drugs (atypical anti psychotic drugs). All current antipsychotics function primarily by blocking dopamine receptors. Present scenario revealed that atypical antipsychotic drugs are widely prescribed for psychotic disorders as compared to typical antipsychotic drugs.*
KEY WORDS: Schizophrenia, antipsychotic drugs, paliperidone,lipopolysaccharide

---

Date of Submission: 27-02-2018 Date of acceptance: 14-03-2018

I. INTRODUCTION

Schizophrenia is a disabling brain disease that is best conceptualized as a category, like dementia, epilepsy, cancer, or anemia, with multiple causes and types. According to Green (1996), schizophrenia is a chronic, debilitating mental disorder with a heterogeneous symptomatology which includes positive, negative and cognitive dysfunction. In the development of schizophrenia genetic susceptibility and environmental toxicants play an important role (McDonald and Murray, 2000; Harrison and Weinberger, 2005) Various environmental factors (including exposure to infectious, toxic, or traumatic insults and stress in utero or during childhood) play a role in the pathogenesis of schizophrenia, perhaps via subtle alterations of neurodevelopment (Marcelis*et al.,* 1998; Tsuang, 2000). Maternal infection during pregnancy is also considered as one of the environmental factors that significantly increases the risk for schizophrenia-related disorders in the offspring (Brown and Susser, 2002; Brown, 2006; Patterson, 2007; Boksa, 2008). Disturbances in immune mechanisms are thought to play a significant role in etiology of schizophrenia (Müller and Schwarz, 2010). The present paper deals with the review of schizophrenia disease and its treatment.

Symptoms of schizophrenia disorder: The symptoms of psychotic disorder fall into three broad categories: positive, negative and cognitive (Kapur and Mamo, 2003; Lieberman *et al.,* 2005). Positive symptoms typically reflect a distortion of normal functions that are regarded as manifestations of psychosis and include auditory and visual hallucinations, delusions, conceptual disorganization and thought disorder. Negative symptoms are associated with emotional blunting, social withdrawal, anhedonia, avolition, poverty of thought and content of speech. Cognitive symptoms including impaired executive function, working memory and attention (Andreasen, 1995; Green, 1996).Hyper- and hypoactivity of Dopamine at its receptor sites suggested to be main reason behind the occurrence of positive and negative symptoms respectively (Strange, 2001; Jones and Pilowsky, 2002; Seeman, 2015; Sharafi, 2005).Furthermore, the deficits in cognitive performance were secondary to the motivational deficit directly associated with overexpression of dopamine receptors (Drew *et al.,* 2007 Ward *et al.,* 2009).

II. MODELS OF SCHIZOPHRENIA

Animal models of psychiatric or mental illnesses (e.g., autism, schizophrenia, depression) have proven enormously useful for determining the roles of genes and environment, for understanding pathogenesis, and for testing potential therapeutic approaches. The bulk of evidence from epidemiological studies in humans have provided substantial evidence that prenatal or early postnatal exposure is associated with an increased risk for the development of several psychiatric illness, most prominently schizophrenia (Geyer and Markou 2002; Powell and Geyer 2007; Swerdlow*et al.,* 1994; Young *et al.,* 2010). Two of the well established animal models

are based on prenatal maternal exposure to bacterial endotoxinlipopolysaccharide (LPS) and viral mimic polyriboinosinic–polyribocytidilic acid (polyI:C) (Baharnoori*et al.,* 2012). Some models also suggest the role of maternal immune system in the development of schizophrenia by the activation of the immune system at direct brain level and activation of HPA axis (hypothamic-pituitary-adrenal) (Dantzer*et al.,* 2008; Monji*et al.,* 2009).

III. TREATMENT BY ANTIPSYCHOTIC DRUGS

Antipsychotic drugs (APDs) are used to treat the symptoms like hallucinations and delusions in patients with mental illness, particularly schizophrenia (Kane and Correll, 2010; Maher *et al.,* 2011). The two main classes of APDs are known as typical and atypical. Typical antipsychotics are also known as first-generation antipsychotics, known such as haloperidol and chlorpromazine used before 1950. Typical antipsychotics are effective in alleviating both the positive and negative symptoms of schizophrenia, although the degree of improvement of negative symptoms is usually less than that of positive symptoms (Goldberg, 1985). Besides their therapeutic efficacy, first-generation agents cause a variety of undesirable adverse events, including acute (dystonia, akathisia and parkinsonism) and later-onset (tardivedyskinesia, extrapyramidal symptoms (EPS) and a propensity to cause hyperprolactinemia. In addition, typical antipsychotics also cause unwanted side effects that are characterized by symptoms of dysphoria/anhedonia, depression and a slowed mentation (Marder, 2005; Voruganti and Awad, 2004).

Now a day's psychiatrics are using atypical antipsychotics drugs (second generation antipsychotics) for the treatment of schizophrenia because atypical antipsychoticsdrugs (AAPDs)as compared to typical antipsychotics drugs cause minimum EPS and successful in treatment of both positive and negative symptoms of schizophrenia (Suginо*et al.,* 2009;

Piontkewitz*et al.,* 2011).Risperidone, paliperidone, olanzapine and clozapine AAPDs are used for the treatment of schizophrenia. However, the successful results of AAPDs in treatment of schizophrenic symptoms some reports also suggested certain side effects such as hypertension, hyperprolactinemia, extrapyramidal movements, tardivedyskinesia, weight gain and metabolic disorders (McIntyre *et al.,* 2001, Maayan and Correll, 2010).

IV. CONCLUSION

Schizophrenia is one of very common and serious brain disease that presents challenging task for neuroscientist to develop efficient antipsychotics with lesser side effect profile. The present scenario revealed the common usage of risperidone, paliperidone, olanzapine and clozapine as AAPDs for the treatment of schizophrenia. Further research is required to understand the precise mechanism of AAPDs action to diminish the side effect for more effective treatment.

REFERENCES:

[1]. Andreasen, N.C., (1995). Symptoms, signs, and diagnosis of schizophrenia. Lancet 346: 477–481.
[2]. Baharnoori, M., Bhardwaj, S.K., Srivastava, L.K., (2012). Neonatal behavioral changes in rats with gestational exposure to lipopolysaccharide: a prenatal infection model for developmental neuropsychiatric disorders. Schizophr. Bull. 38, 444–456.
[3]. Boksa, P., (2008). Maternal infection during pregnancy and schizophrenia. J. Psychiatry Neurosci. 33, 183–5.
[4]. Brown, A.S., (2006). Prenatal infection as a risk factor for schizophrenia. Schizophr. Bull. 32, 200-2.
[5]. Brown, A.S., Susser, E.S., (2002). In utero infection and adult schizophrenia. Ment. Retard. Dev. Disabil. Res. Rev. 8, 51–57.
[6]. Dantzer, R., O'Connor, J.C., Freund, G.G., Johnson, R.W., Kelley, K.W., (2008). From inflammation to sickness and depression: when the immune system subjugates the brain. Nat. Rev. Neurosci. 9, 46–56.
[7]. Drew, M.R., Simpson, E.H., Kellendonk, C., Herzberg, W.G., Lipatova, O., Fairhurst, S., (2007). Transient overexpression of striatal D2 receptors impairs operant motivation and interval timing. J. Neurosci. 27(29), 7731-7739.
[8]. Goldberg, S.C., (1985). Negative and deficit symptoms in schizophrenia do respond to neuroleptics. Schizophr. Bull. 11, 453–456.
[9]. Green M.F., (1996). What are the functional consequences of neurocognitive deficits in schizophrenia? Am J Psychiatry. 153:321–30.
[10]. Harrison P.J., Weinberger, D.R,. (2005) Schizophrenia genes, gene expression, and neuropathology: on the matter of their convergence. Mol Psychiatry. 10:40–68.
[11]. Jones, H.M., Pilowsky, L.S., (2002). Dopamine and antipsychotic drug action revisited. Br. J. Psychiatry, 181, 271–275.
[12]. Kane, J.M., Correll, C.U., (2010). Past and present progress in the pharmacologic treatment of schizophrenia. J. Clin. Psychiatry, 71(9), 1115–24.
[13]. Kapur, S., Mamo, D., (2003). Half a century of antipsychotics and still a central role for dopamine D2 receptors. Prog. Neuropsychopharmacol. Biol. Psychiatry, 27, 1081–1090.
[14]. Lieberman, J.A., Stroup, T.S., McEvoy, J.P., Swartz, M.S., Rosenheck, R.A., Perkins, D.O., et al., (2005). Effectiveness of antipsychotic drugs in patients with chronic schizophrenia. N. Engl. J. Med. 353, 1209–1223.
[15]. Maayan, L., Correll, C.U., (2010). Management of antipsychotic related weight gain. Expert Rev. Neurother. 10, 1175–1200.
[16]. Maher, A.R., Maglione, M., Bagley, S., Suttorp, M., Hu, J.H., Ewing, B., et al. (2011). Efficacy and comparative effectiveness of atypical antipsychotic medications for off-label uses in adults: a systematic review andmeta-analysis. JAMA, 306(12), 1359-1369.
[17]. Marcelis, M., Os, J.V., Sham, P., Jones, P., Gilvarry, C., Cannon, M., McKenzie, K. Murray, R., (1998). Obstetric complications and familial morbid risk of psychiatric disorders. American journal of medical genetics,81: 29-36.
[18]. Marder, S.R., (2005). Subjective experiences on antipsychotic medications: synthesis and conclusions. ActaPsychiatr. Scand. Suppl. 111(427), 43–46.

[19]. McDonald C, Murray R.M., (2000). Early and late environmental risk factors for schizophrenia. Brain Res Brain Res Rev. 31:130–7.
[20]. McIntyre, R.S., McCann, S.M., Kennedy, S.H., (2001). Antipsychotic metabolic effects: weight gain, diabetes mellitus, and lipid abnormalities. Can. J. Psychiat. 46, 273–281.
[21]. Monji, A., Kato, T., Kanba, S., (2009). Cytokines and schizophrenia: Microglia hypothesis of schizophrenia. Psychiatry Clin. Neurosci. 63(3), 257-265.
[22]. Müller, N., & Schwarz, M. J. (2010). Immune system and schizophrenia.Current immunology reviews, 6(3), 213.
[23]. Patterson, P.H., (2007). Neuroscience. Maternal effects on schizophrenia risk. Science, 318, 576–7.
[24]. Piontkewitz, Y., Arad, M., Weiner, I., (2011). RIS administered during asymptomatic period of adolescence prevents the emergence of brain structural pathology and behavioral abnormalities in an animal model of schizophrenia. Schizophr. Bull. 37, 1257–1269.
[25]. Powell, S.B., Geyer, M.A., (2007). Overview of animal models of schizophrenia. Curr. Protoc. Neurosci. 9-24.
[26]. Seeman, P., (2015). Atypical Antipsychotics: Mechanism of Action. Focus, 2, 48-58.
[27]. Sharafi, M., (2005). Comparison of classical and clozapine treatment on schizophrenia using positive and negative syndrome scale of schizophrenia (PANSS) and SPECT imaging. Int. J. Med. Sci. 2, 79–86.
[28]. Strange, P.G., (2001). Antipsychotic Drugs: Importance of Dopamine Receptors for Mechanisms of Therapeutic Actions and Side Effects. Pharmacol. Rev. 53, 119–133.
[29]. Sugino, H., Futamura, T., Mitsumoto, Y., Maeda, K., Marunaka, Y., (2009). Atypical antipsychotics suppress production of proinflammatory cytokines and up-regulate interleukin-10 in lipopolysaccharide-treated mice. Prog. Neuropsychopharmacol. Biol. Psychiatry, 33(2), 303-307.
[30]. Swerdlow, N.R., Braff, D.L., Taaid, N., Geyer, M.A., (1994). Assessing the validity of an animal model of deficient sensorimotor gating in schizophrenic patients. Arch. Gen. Psychiatry, 51(2), 139-54.
[31]. Tsuang, M., (2000). Schizophrenia: genes and environment. Biol. Psychiatry, 47, 210–220.
[32]. Voruganti, L., Awad, A.G., 2004. Neurolepticdysphoria: towards a new synthesis. Psychopharmacology (Berl), 171, 121–132.
[33]. Ward, R.D., Kellendonk, C., Simpson, E.H., Lipatova, O., Drew, M.R., Fairhurst, S., et al., (2009). Impaired timing precision produced by striatal D2 receptor overexpression is mediated by cognitive and motivational deficits. Behav. Neurosci. 123, 720–730.
[34]. Young, J.W., Goey, A.K., Minassian, A., Perry, W., Paulus, M.P., Geyer, M.A., (2010). The mania-like exploratory profile in genetic dopamine transporter mouse models is diminished in a familiar environment and reinstated by subthresholdpsychostimulant administration. Pharmacol. Biochem. Behav. 96, 7–15.

Umesh Kumar."Schizophrenia and Its Treatment: An Overview" International Journal of Pharmaceutical Science Invention(IJPSI), vol. 07, no. 03, 2018, pp. 13-15.