

the destruction of homework and psychological abuse. The victims are afraid not only of physical violence but also of constant condemnation, isolation and loneliness. There are schools with high and schools with low incidence of bullying however no one is free of this phenomenon. There are described both individual bullies and bullying groups of even seven years olds. In UK up to 1 mln pupils are involved in bullying. In Scandinavia over 25% children experienced bullying. In Poland 30% pupils aged 14–16 were involved in bullying since over 60% of them admitted of violence in peer conflicts. Any features could be picked on as a pretext for bullying. Physical characteristics are a factor, particularly differences in physical appearance and strength, but the importance of these are overestimated.

Low self-esteem seems to be a common traits of victims. Other personality factors and the role of early learning particularly a tolerance of aggressive behaviour seems to be the key features as well. The groups of bullies and victims vary on a number of personality, physical and social dimensions. Some founded roots of bullying in familial, economical and political backgrounds. It is stressing close relationship between social deprivation and bullying.

The schools own role and parental attitudes and practices in reducing bullying are considered.

#### WHEN PREGNANCY BECOMES A SOURCE OF VIOLENCE

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Although pregnancy and violence may sound like two antinomic terms, with pregnancy usually associated with the happy expectation of a child, yet the psychic work that a pregnant women has to accomplish all through her pregnancy until her child's birth is not free from a certain amount of violence: such violence may be due to the unconscious reviviscence of former oedipian conflicts from childhood, to her ambivalence with regard to the child, to the questioning of the image of her own body, or to a structuring crisis the couple might be going through. In some particular cases, violence may also be inherent to pregnancy: emotional or socio-economic conditions that surround the mother-to-be, incidents or accidents occurring during pregnancy, that have to be studied in the light of child-desire and mourning, whether a pessimistic pre-natal diagnosis, the threat of premature birthgiving, in-utero death, a medical interruption of pregnancy, a still-born baby or medically assisted procreation and so on ... It is essential to take into account the psychic suffering of mothers who experience such violence, especially when one bears in mind that, if built-upon, if failed to be resolved, this violence might lead to postnatal depressive states, to the building up of a bad quality parent/child relationship, to pathologic mourning with the expectable consequences those pathologic behaviours are bound to have on the child's emotional development. It is therefore of capital importance to train and inform the medical staff on those subjects; those are one of the main stakes in therapy and prevention in the field of perinatal psychiatry.

#### INFANTICIDE

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The Infanticide Act (1938) of England and Wales codifies the concept of diminished responsibility when a woman kills a child aged less than 12 months. The offence may be regarded as manslaughter if, at the time, the balance of her mind was disturbed by reason of not having fully recovered from childbirth, or by reason of lactation.

Thus, the law seems to acknowledge a link between the biological changes associated with childbirth and lactation and mental illness, and that this combination of factors contribute to the homicide of infants by their mothers. In England and Wales, a child under 1 year of age is four times more likely to be the victim of homicide than a child older than a year or the general population [1]. However, clear evidence of severe maternal mental illness is lacking in most cases of infanticide and infants older than a day are slightly more likely to be killed by their fathers. We know relatively little about the psychopathology and characteristics of parents who kill their infants or who subject them to non-fatal harm. Some relevant evidence will be reviewed and the possibility explored of setting up comparisons between nations.

[1] Marks MN & Kumar R (1993) *Medicine Science & The Law* 33: 329–340.

#### ATTEMPTED SUICIDE AND PSYCHIC TRAUMA IN ADOLESCENCE

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On the basis of clinical cases of suicidal adolescents, I illustrate the analogy between nightmare and psychic trauma. Sideration occurs when a traumatic experience strikes the mental apparatus. The latter is then no longer able to cope with excitement provoked by instincts. Suicidal teenagers try to avoid situations liable to trigger and "identity topsy-turvy" in which the psychic apparatus is unable to ensure the binding activity and thus unable to think. The possible reasons for this feeling of identity vacillation and for its potentially lethal character will be discussed. Attempting suicide would seek to suppress an unacceptable identity as well as the own body and its instincts, and would try to restore a certain feeling of self-esteem.

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### S76. Diverse applications of psychotherapy

*Chairmen: T Sensky, M Crowe*

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Abstracts not received.

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### S77. 20 years of functional neuroimaging: neurochemistry

*Chairmen: G Sedvall, L Pilowsky*

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#### PET D<sub>1</sub>-RECEPTOR STUDIES IN SCHIZOPHRENIA

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Previous post mortem studies in schizophrenic patients gave inconsistent results concerning striatal D<sub>1</sub>-receptor densities [1]. In the present study we examined D<sub>1</sub>-receptor binding in vivo in the striatum of healthy subjects and drug naive schizophrenic patients using PET.

Eleven healthy subjects (10 men, 1 woman; 23–34 years) and nine neuroleptic naive schizophrenic patients (8 men, 1 woman; 21–28 years) (DSM-IV) were recruited according to previously formulated criteria [2]. MRI was performed to exclude brain pathology. Two PET experiments were performed in each subject. In each experiment 200–300 MBq of the  $^{11}\text{C}$ -labelled selective  $\text{D}_1$ -receptor antagonist SCH 23390 was injected IV as a bolus. In the first a high (321–2061 Ci/mmol) and in the second a low specific radioactivity (2.3–4.3 Ci/mmol) was injected. Radioactivity was measured for 33–63 min using the Scanditronix PC2048-15B PET-system. Anatomical delineations for regions of interest (ROI's) for the caudate nucleus and putamen were made on all MRI sections where these structures appeared. For the cerebellum ROI's were drawn on the 2 middle sections. The ROI's were transferred to the corresponding PET sections. The total radioactivity in each structure was measured for each sequential scan, corrected for decay and plotted as a function of time. For the quantitative analysis the cerebellum was used as reference region to estimate the free radioligand concentration in the brain. Specific [ $^{11}\text{C}$ ]SCH 23390 binding was defined as the difference of radioactivity concentration in the caudate/putamen and that in the cerebellum. An equilibrium analysis was performed to determine  $B_{\text{max}}$  (density) and  $K_d$  (affinity) values for [ $^{11}\text{C}$ ]SCH 23390 binding in the caudate and putamen [2].

There was no difference between the group means of the  $B_{\text{max}}$  and  $K_d$  values in the caudate and putamen (Fig). There was a significantly greater variability both in the  $B_{\text{max}}$  and  $K_d$  values of the putamen in the patient group (Fig). There was also a significantly greater variability in the  $K_d$  values of the caudate in the patients ( $p < 0.01$ ). The Bound/Free ratio (binding potential) in the putamen tended to be lower in the patient group ( $p = 0.1$ ) (Fig.).

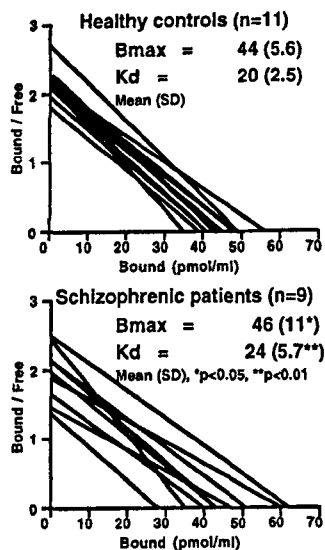


Fig. Scatchard plot of [ $^{11}\text{C}$ ]SCH 23390 binding in the putamen measured by PET

The larger variability of [ $^{11}\text{C}$ ]SCH 23390 binding may reflect a disturbed  $\text{D}_1$ -dopamine receptor activity in some schizophrenic patients.

- [1] Knalbe MB, Hyde TM, Herman MM, et al. Quantitative autoradiography of dopamine-D1 receptors, D2 receptors, and dopamine uptake sites in post-mortem striatal specimens from schizophrenic patients. *Biological Psychiatry* 1994; 36(12): 827–835.
- [2] Farde L, Wiesel F-A, Stone-Elander S, et al. D2 dopamine receptors in neuroleptic-naive schizophrenic patients. *Arch Gen Psychiatry* 1990; 47: 213–219.

## 5HT<sub>2</sub> RECEPTOR MEASUREMENT IN SCHIZOPHRENIA BY PET

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An involvement of the serotonergic system has been hypothesized in schizophrenia: some post-mortem studies reported abnormalities of the 5-HT<sub>2</sub> receptor numbers in the prefrontal cortex of schizophrenic patients. Furthermore, many antipsychotic drugs (APD) have a high affinity for these receptors and it has been proposed that this ability might be involved in some of their therapeutic effects. We used positron emission tomography and 18-F Setoperone, a high affinity radioligand of cortical 5-HT<sub>2</sub> receptors, in order to study: 1/ the in vivo frontal cortex 5-HT<sub>2</sub> receptor density in a group of untreated schizophrenic patients and 2/ the effect of conventional dosages of various antipsychotic drugs on the binding of 18-F setoperone to these receptors.

Preliminary analysis in a group of 14 untreated schizophrenics did not demonstrate change in the frontal cortex 18-F setoperone specific binding. However, when compared with the untreated group, patients receiving chronic treatments by clozapine (CZP) but also by chlorpromazine (CPZ) had a marked reduction of the specific binding of 18-F setoperone in the frontal cortex. In the CPZ group, this reduction correlated with oral and plasma dosages of the drug, and total saturation of the cortical 5-HT<sub>2</sub> receptors was reached for oral doses equal or superior to 800 mg/d. In the CZP group, usual therapeutic doses induced at least 80% occupancy of these receptors and saturation was reached at 500 mg/day. Patients treated by amisulpride, a specific dopaminergic receptors antagonist, did not differ from untreated patients. In the basal ganglia, interaction with the 18F Setoperone binding was less marked with CZP than with CPZ.

These results suggest that both CZP and a typical neuroleptic such as CPZ produce at therapeutic dosages a significant effect on the cortical serotonergic system in schizophrenic patients. This effect appears to be neither specific to atypical APD nor common to all neuroleptics.

## THE IMPACT OF IN VIVO RECEPTOR PET MEASUREMENT ON NEUROPHARMACOLOGY

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Positron emission tomography (PET) is a direct, quantitative approach to explore relationships among central neuroreceptor occupancy, psychotropic drug blood levels and clinical effects. In the development of new drugs PET may be used to define dose-response relationships and to explore mechanisms of atypical effects. We have used the radioligands [ $^{11}\text{C}$ ]raclopride and [ $^{11}\text{C}$ ]NMSP to study antipsychotic drug binding to central D<sub>2</sub>- and 5-HT<sub>2</sub> receptors in man. Clinical treatment with classical neuroleptics induces a uniformly high (70–90%) D<sub>2</sub> receptor occupancy. The risk of extrapyramidal side-effects was significantly increased in patients with D<sub>2</sub> receptor occupancy above 80%, whereas patients with low (below 50%) occupancy were less likely to receive antipsychotic effect. Receptor occupancy was high already at low drug plasma concentrations. Schizophrenic patients in remission treated with haloperidol decanoate had only an intermittently high (> 70%) occupancy during a 4-week injection interval. A continuously high D<sub>2</sub> receptor occupancy may thus not be required to prevent schizophrenic relapses. Our observations point to the need to re-evaluate dose-response char-