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CONFERENCE ABSTRACTS

6. GENERAL QUESTIONS: PSYCHIATRY OF STRESS

MULTIPLE DELAYED VERBAL REACTIONS (MDRV) AS VULNERABILITY INDICATORS FOR SCHIZOPHRENIA

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Multiple Delayed Verbal Reactions (MDRV) methods allow us to identify early cerebral impairments in different phases of brain cognitive functions, such as pre-programming and programming, Working Memory task-independent and task-dependent processes, and transfer between perceptive and executive system and modulation of the final output. MDRV yields information on the two domains of brain function: 1) the processes involved in verbal processing, developing from the language cortical areas to the corresponding phasic motor system, and 2) the general processes of sensomotor integration, programming and attention that are task-independent. The neural substrate involved is the prefrontal network. The brain elementary function is represented by the Central Executive System of Working Memory and more specifically by the delayed reaction.

MDRV method: the task stimuli consist of a monosyllable, a dysyllabic word and a sentence, all with the same pronunciation, each presented on the screen of the monitor 12 times in random succession. The subject is asked to pronounce the word immediately with a loudspeaker placed near his mouth, while some pairs of surface electrodes record the EMG from oromandibular muscles. In a second series of reactions he is asked to answer only after 0.5–4 s interval has elapsed following the appearance of the task-stimulus; in that moment a go-signal (asterisks) appears on the screen. The main parameters studied were: 1) the latency time of the immediate reaction (tACG at FP = 0). The mean value of tACG at FP = 0 depends on: a) the functional state of the executive systems b) the programming, c) the timing processes. The difference tACG-tEMG as a cue of the relationship between preparatory and timing processes and the duration of ACG (D ACG) as a cue of the timing processes. A further, but not less significant parameter, is represented by the percentage of errors, particularly anticipation-errors. 2) The index of the effects of interfering stimuli. The IF-in, namely tACG at FP = .1/ t ACG at FP = 0 depends on lateral inhibition processes and on available cerebral associative channels. 3) The index of the latent learning occurring during the Temporal Bridging (TB) of delayed reactions (TB-in). TB indices, namely the ratios between tACG at FP = 0.5s, or tACG at FP = 1.5 s, or tACG at FP = 4 s as numerators, and tACG at FP = 0 at the denominator, reflect the course of facilitation processes associated with TB. We have examined 80 patients (30 males and 50 females) classified as schizophrenics according to the DSM III-R criteria and 40 normal patients for comparison: all s.p. were treated with atypical anti-psychotic drugs.

Results. On the basis of the MDRV we divided the patients in 3 subgroups: 31 with TB-in >1 at FP .5 and 4s (paranoid schizophrenics), 16 with TB-in >1 at FP 1.5s (positive syndromes), 33 with TB-in >1 at FP 0.5, 1.5 and 4s (severe cases of disorganized schizophrenia). We have observed the most significance difference in paranoid schizophrenics vs. normal controls in TB-in at FP = 0.5 and at FP = 4s, with a trend to higher values in schizophrenics. We have found that positive syndromes with

acute exacerbations shows the highest TB-in increase at $FP = 1.5s$ in a range of .90 to 2.4. In severe cases of disorganized schizophrenia TB-in increased at all FPs with highest values at $FP = 4s$: 1.6 to 2.35.

Discussion. A fundamental point inferred from the occurrence of TB-in inversion and impairment in both patients with frank symptoms of schizophrenia and relatives of schizophrenics without clinical symptoms of schizophrenia is that the impairment of WM and delayed reactions associated with a dorso-lateral prefrontal state independent hypoactivity, does not necessarily cause the dysfunctions that lead to the schizophrenic behavior. These prefrontal-dependent impairments could be hardly considered to reflect the cerebral dysfunction that actually produces dysphrenic alterations at the mental level, and dysexecution at the behavioral level. The schizophrenic disorder is in fact a heterogeneous and even the follow-up prognostic criterium of progressiveness adopted by Kraepelin for differentiating dementia praecox from manic-depressive psychosis, is under discussion. A general prefrontal dysfunction that is in itself latent at the level of the general cerebral performance ultimately responsible of the output seems to be a more likely interpretation. The picture in the twins is very interesting from the MDRV point of view because it shows another aspect of schizophrenia. Indeed, obsessive-compulsive symptoms in patients with schizophrenia occur in 8–10% (Rosen, 1986), and the comorbidity totals 3–25% (Ingram, 1961), in this case we have an abnormal acceleration in delayed reactions with an impairment of lateral inhibition detected in interfering-stimuli-reactions. These results are in agreement with those obtained by Park et al. (1995) on Working Memory, and Schreiber et al. (1998) on the P3 and N2 components of the Event-Related-Potentials, thus proving that TB-in inversion represent an index of vulnerability for schizophrenia.