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The Wechsler Intelligence Scale in the Diagnosis of Central Nervous Diseases in Children

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In 144 children with various CNS diseases a psychological and clinical analysis has been made by means of the Wechsler Intelligence Scale for Children. In children with a normal or nearly normal I. Q., a difference between V. Q. and P. Q. exceeding 10 points was statistically significantly indicating some organic CNS lesion. On the other hand, this correlation did not exist in mentally deficient children, despite the unquestionable presence of organic CNS changes. This seems to be due to the injury of several CNS structures.

In addition, the WISC test has been performed on 66 children with various clinical forms of epilepsy (grand mal and petit mal paroxysms, focal epilepsy, temporal epilepsy, and epilepsy with a mixed clinical picture, etc.). There was a difference between V. Q. and P. Q. in every type of epilepsy with the only exception of petit mal paroxysms; this once again confirms the fact that this kind of paroxysm has a different pathomechanism.

Finally, the advantages offered by the use of WISC psychograms in the diagnosis of CNS diseases in children are emphasized.

INTRODUCTION

Among a number of methods to test intelligence in children the, Wechsler Intelligence Scale for Children (WISC) is frequently applied. It allows not only to determine the I.Q., but also to draw a diagram, the so-called psychogram which makes it possible to observe correlations between the results of verbal and performance tests and their relation to the total result [1, 4].

According to WECHSLER [4], mental efficiency in adults is best examined by performance tests, since the intellectual functions which are evaluated by means of performance tests are harmed or diminished more rapidly than those examined by verbal tests. Performance tests require a good visuomotor co-ordination, perceptiveness and motor activity, and are performed on a concrete material. This is why results obtained in the performance scale that are lower than those in the verbal scale may suggest a suspicion of central nervous disease. With the use of the Wechsler Intelligence Scale for Adults one can determine even the so-called deficiency quotient which originates in the fact that the solution of certain problems may be influenced not only

by the age of the subject, but also by the kind of the disease he suffers from. On the basis of clinical observations there have been determined the shapes of psychographic curves characteristic of various syndromes in adults, e.g. a depressive state, schizophrenia, neurosis, etc., and it was proved that between the shapes of psychographic curves and certain clinical syndromes there is a correlation which may have a diagnostic value.

In this connection we have decided to analyse WISC psychograms and to assess the usefulness of this test in the diagnosis and differentiation of central nervous diseases in children. This task seemed the more purposeful as among the tests applied for detecting organic changes in the central nervous system of children, the value of WISC is often underestimated. Still, in our own experiments this scale allowed a precise assessment of the fact whether and to what extent the existing injury had diminished the child's mental efficiency [2, 3].

Thus, the aim of the present study was to analyse WISC psychograms and to establish the usefulness of the method in the diagnosis and differentiation of CNS diseases in children.

Material and Method

We have examined with the use of WISC 144 children (80 boys and 64 girls), aged 5—16 years; the majority was 7—13 years of age. The analysis of psychograms included I.Q. in the Wechsler Full Scale and intelligence sub-quotients in the Wechsler Verbal and Performance Scales, in particular the psychograms that showed an evidently lower performance quotient (P.Q.) than verbal quotient (V.Q.), i.e. over 10 points. We assume that these differences found between the results of the two scales may be indicative of organic changes in the CNS [3]. A number of cases were examined by means of other psychological methods, e.g. Oseretsky's, Bender's, Raven's tests, so as to deepen the diagnosis and verify the results obtained by means of WISC.

The results of the psychological examinations were analysed on the basis of a number of other clinical data, e.g. history, divergences from the normal results of neurological, electro-encephalographic and pneumo-encephalographic examinations, etc.

Results and Discussion

A detailed analysis of the obtained results allowed to divide the examined children into the following three groups.

Group I included 58 children at a normal or nearly normal intellectual level (I.Q., 80—133) in whom the difference between V.Q. and P.Q. was 12—15 points. On the basis of the above-mentioned clinical criteria, 54 children of this group showed changes indicative of organic CNS lesions (brain tumour, perinatal injury, hemiparesis, pyramidal and extrapyramidal syndromes of various aetiology, etc.). In one child considered difficult with symptoms of over-excitability and three children with headache, we were unable to detect any changes in the CNS, although the difference between V.Q. and P.Q. amounted to 15—45 points.

Group II included 68 children with a normal I.Q. in whom the difference

between V.Q. and P.Q. did not show any symptom of an organic CNS lesion, while among the remaining 25 children there were 13 with changes of this kind (CNS injury in early childhood; traumatic epilepsy including EEG changes and symptoms of focal lesions). The remaining 12 children had petit mal paroxysms confirmed by EEG records, and myoclonia without any other CNS abnormality and with a normal pneumo-encephalographic finding. This group will be discussed in detail below.

Group III comprised children with an I.Q. below 70. Apart from the mental handicap, the children showed a number of symptoms indicative of some organic pathological process in the CNS. Only in 3 of the 18 children in this group did the difference between V.Q. and P.Q. exceed 10 points. The remaining 15 children did not show the above-mentioned difference between V.Q. and P.Q. despite unquestionable symptoms suggesting multifocal CNS changes.

Analysis of the data for the children with organic CNS lesions whose intellectual level was normal proved that the statistically significant majority showed a considerable difference between V.Q. and P.Q., over 10 points in favour of V.Q. This might therefore suggest that the results of the WISC may be a useful diagnostic element when combined with a number of other clinical methods. A considerable difference between V.Q. and P.Q. suggests an organic background of the pathological process; this may be particularly useful in the cases which cannot be detected or confirmed by clinical data.

The greatest inconsistencies in the attempt to correlate the results of WISC and the clinical data occurred in Group III, which comprised children with multifocal CNS lesions and mental deficiency of various degrees. Despite unquestionable organic changes in this group of 22 children, only 3 showed greater differences between V.Q. and P.Q. This fact may be explained by changes being present in several structures of the CNS; these might bring about lower results in the two scales.

The WISC in children with epilepsy

Results of WISC in children with epilepsy were also analysed since in our previous investigations we noticed the fact that epilepsy does not always affect intellectual efficiency as much as it might be indicated by the psychogram [2, 3]. To this end we have applied the WISC in children with various clinical forms of epilepsy (grand mal, petit mal, focal epilepsy, temporal epilepsy and epilepsy with a mixed clinical picture, e.g. grand mal with myoclonia, etc.).

A total of 66 children (36 girls and 30 boys) were examined; their age ranged from 6 to 16 years, of the majority from 7 to 13 years. The analysis comprised I.Q. in the Wechsler Full Scale as V.Q. and P.Q. Particular attention was paid to those epileptic children who showed a V.Q. more than 10 points higher than P.Q., since such a result may be indicative

of organic CNS changes [2, 3]. Results of psychological examinations were considered in the context of a number of other clinical data (history, the moment of the first attack, the applied treatment, divergences from the normal indicated by neurological examinations, EEG, pneumo-encephalography, etc.).

The largest group [34] comprised patients with grand mal paroxysms in whom the above mentioned examination detected organic CNS changes manifesting themselves with hemiparesis, brain atrophy and ventricular hypertrophy, etc. Twentyeight children of this group showed a 13—43 points difference between V.Q. and P.Q. In the remaining 6 cases the difference was below 10 points; however, 3 of these concerned children with a low I.Q. [78, 56, 56, respectively]. It may be considered consistent with our former findings that a lesion of many CNS structures may bring about a lower V.Q. and P.Q. without any significant differences between them. The other 3 cases concerned children with cranial injuries.

In 10 children with other clinical forms of epilepsy there was a difference between V.Q. and P.Q. exceeding 10 points.

Particular attention should be paid to the results of WISC in children with petit mal paroxysms. Among 16 such children, 13 showed no difference between V.Q. and P.Q., as another evidence of the different pathogenesis of these paroxysms. Only in 3 cases (with a generally good intellectual level) did the difference between V.Q. and P.Q. amount to 22, 28 and 32 points, respectively.

On the basis of the above findings, the considerable difference between V.Q. and P.Q. in children with petit mal paroxysms is indicative of a reserved prognosis, since it suggests an organic process in the CNS which may change the morphology of the paroxysms. We had opportunity to observe children with petit mal paroxysms who in a later period of their life developed grand mal ones.

There is sometimes an evident relation between the results of WISC and the frequency of paroxysms [3]. In such cases, follow-up examinations indicate that the difference between V.Q. and P.Q. increases in patients displaying frequent paroxysms, particularly of the grand mal type.

It seems particularly interesting to make a prognostic use of the difference between V.Q. and P.Q. in children with cranial injuries and traumatic epilepsy, since an injury of the skull, even if followed by loss of consciousness, convulsions and slight divergences from the normal does not give rise to significant differences between V.Q. and P.Q. in children. Such divergences may suggest fixed changes in the CNS but this of course depends on a number of factors, e.g. on the child's age and the degree of CNS maturity, on the period between the moment of injury and the examination, etc.

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