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cases of clinically diagnosed rubella. The advances in rubella virus research now provide the necessary techniques for the accurate diagnosis as one of the criteria for interrupting pregnancy, and laws which will place the choice of terminating such pregnancies in the hands of those who will bear the responsibility of the abnormal child, will provide a more realistic approach to this problem until rubella can be controlled by vaccination.

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Impaired Delayed Hypersensitivity

To the Editor:—I was very much interested in the report of Waldorf et al (203:831, 1968) concerning the impairment in skin reactivity of older individuals after the induction of delayed skin test reactions by the application of patch tests of 2, 4-dinitrochlorobenzene (DNCB). While these studies involved delayed skin test reactions, I wondered whether any of these individuals also had been tested with allergens producing immediate-type skin test reactions and if so, whether such reactions also were reduced in intensity. I am interested because in July 1955 my associates and I[1] reported the results of studies designed to show the influence of age upon skin reactivity as applied to direct skin test reactions. To determine this, we did intradermal skin tests upon nonallergic individuals in all the age decades from infancy on, with histamine solution diluted 1:1,000, 1:10,000, 1:100,000, and 1:million, using 100 individuals for each decade of life. The results of these tests showed that skin reactivity, at least for the direct skin test reaction, was highest in the first decade of life. It then diminished somewhat between the first and the fifth decade but was considerably reduced after the age of 60. Knowledge of this loss of skin reactivity in older people can be important clinically in doing allergy tests upon older people, especially those past 50 or 60. Unless this impaired reactivity is recognized, if tests in such individuals are negative or even doubtfully positive, it might lead to false clinical interpretation of the results obtained. For example, such individuals may be classified as being nonallergic or nonsensitive and in the case of asthma as probably having an infectious etiology; on the other hand, a realization that such persons tend to have a low threshold of skin reactivity does not necessarily exclude specific allergies which may require other methods for their detections, eg, diet trial. Likewise even if the positive reactions are weaker than those obtained in younger individuals they still can have as much clinical significance as much stronger positive reactions obtained in younger individuals with more reactive skins. As a result of these studies, we now do intradermal skin tests with histamine diluted 1:10,000 and 1:100,000 to determine the skin reactivity of those individuals, especially older ones in whom the tests may be negative, and as a guide as to what additional studies may be required. It would seem, therefore, both from the studies of Waldorf et al and our own, that the skin reactivity of older individuals is impaired both in relation to immediate-type and to delayed-type skin test reactions, a fact which should be remembered in their employment in clinical practice.

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Adverse Effects of Niacin In Emergent Psychosis

To the Editor:—Since 1962, several reports have described the apparently successful treatment of schizophrenia with repeated large doses (up to 3 gm daily) of niacin, either as niacin or niacinamide.[1-5] All of these studies used a reduction in length of hospitalization as the indicator of drug effect, and although the niacin-treated patients spent fewer days in the hospital, the use of only this one measure of outcome and the lack of replication by other investigators limit the general applicability of the studies. In the *New York Times* (March 31, 1966), there was a report of successful treatment in three to five days of 13 out of 17 (acute and chronic) schizophrenic patients by administering orally 1 to 2 gm of nicotinamide adenine dinucleotide (NAD), better known as nadide. Subsequently there have been two published reports which fail to demonstrate any therapeutic effects of this compound.[6,7]

Even though the claims of successful niacin therapy in schizophrenia have not received independent support, there continues to exist a belief in its usefulness in some lay and professional circles. We have observed that patients sometimes request niacin be used in their treatment. These requests are little different than numerous other wishes for relief and can usually be successfully dealt with. Of more serious import are those instances where niacin is prescribed and used in an attempt to ward off impending psychosis. In these instances the false sense of security stemming from the belief in the prophylactic value of niacin may lead to serious consequences. In addition there is suggestive evidence that the pharmacologic effects of niacin (particularly the flush) interact and possibly potentiate the psychotic symptoms. The following two case reports illustrate these points.

Report of Cases.—This 25-year-old white man successfully completed college at age 23 but upon graduation began to experience "break-downs" consisting of intermittent and transient episodes of "apathy, depression, worthlessness, and loneliness." The patient felt apart from his environment, and was unable to "make contact with anyone or become emotionally involved." These episodes occurred with mildly increasing frequency during the two years between graduation and his eventual hospitalization. The patient was aware of the abnormality of these feelings and after reading of the alleged usefulness of niacin for "people with schizophrenic tendencies," he took approximately 1.5 gm of niacin within a one-half hour period. Shortly thereafter he experienced a marked flush which produced considerable anxiety and within a few hours the first of a series of uncontrollable crying spells occurred with continuous feelings of panic and the need for close physical contact. The following day the patient smoked marihuana. Whereas marihuana smoking had been pleasant on four previous occasions, this time he became terrified, felt that his mind was drifting away, and that he had lost his identity. In addition, the patient began to experience frighten-

ing dreams. These symptoms gradually increased in severity so that hospitalization was necessary five days later. In the hospital the patient was found to be extremely fearful and agitated, with involuntary tremors of his limbs. There were repeated crying episodes alternating with periods of control, and he reported mild perceptual distortions such as people looking distant and objects moving with irregular bursts of speed. The patient was well-oriented and had not formed hallucinations or delusions. Psychologic testing two months later demonstrated a borderline psychotic character.

CASE 2.—This 28-year-old unmarried writer had taken LSD in three unsupervised sessions over the year prior to his hospitalization. The reactions were very characteristic of LSD experiences and consisted of the usual sensory alterations and a mixture of pleasant and unpleasant feelings. There was some evidence that the unpleasant aspects of the experience were becoming more dominant with each use of LSD. Several weeks prior to hospitalization, a psychiatrist (who was also a friend) placed the patient on approximately 3 gm of niacin a day telling the patient that the niacin would help him "go way back into childhood traumas." The patient experienced a "kind of amphetamine effect" during this period. Four days prior to his hospitalization the patient took his fourth LSD "trip" in the presence of (and with) the same psychiatrist. The reaction consisted of sensations of increased sensory input, sudden increased insight into life, sensitivity to detail, and increased sensory vividness. These symptoms did not abate and there was a progressive formation of delusions which necessitated hospitalization four days later.

Comment:—Both cases illustrate the obvious point that uncritical acceptance of an unproven treatment generates a false sense of security which may delay or prevent proper medical attention. We view this as an "iatrogenic side effect" of all placebo medications. There is suggestive evidence that the pharmacologic effects of niacin potentiated the psychotic symptoms in the two cases presented here. In the first case, the flush caused considerable anxiety and was quite clearly followed by an increase in the severity of anxiety attacks and crying episodes, which eventually led to hospitalization. In the second case, the "amphetamine-like effect" experienced after niacin seemed to be a milder manifestation of the increased sensory input which followed the LSD and led to progressive delusion formation. In both cases, following niacin, drug experiences which had previously been mainly pleasant ones turned into frightening psychotic experiences. Clearly no conclusion can be based on data from only two cases since this may simply be a fortuitous relationship between drug use and emerging psychosis. However, until firm clinical evidence of benefit is available, we urge caution in the prophylactic and therapeutic use of niacin with psychiatric patients.

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Belladonna Poisoning as a Facet of Psychodelia

To the Editor:—During the past year, seven youths between the ages of 15 and 19 were admitted to the psychiatric services of the Mayo Clinic with acute belladonna intoxication, and two others were referred for psychiatric evaluation after episodes of acute psychotic behavior subsequent to the ingestion of a stramonium and belladonna mixture (Asthmador) for conscious-expanding purposes. This is another documentation of the use of this patent medicine as a hallucinogen.[1-3] A substance intended for burning with inhalation of the smoke by asthmatics, the mixture's active ingredients are belladonna, stramonium, and related alkaloids which have hallucinogenic properties when taken orally in less than lethal amounts. It is readily obtainable without a prescription from any drugstore.

Of the seven patients seen to date for acute belladonna intoxication, one is borderline mentally retarded. Another was felt to have a personality disorder, and a third appeared fairly normal in every respect. The remaining four patients seemed to be dealing with identity crises of varying degrees of severity. Although the family background, socioeconomic status, and personality organization vary considerably among our patients who ingested the stramonium and belladonna mixture, in each case there had been expectation that a "kick" or an expansion of consciousness would be forthcoming. In some instances the material was obtained from friends or strangers and was taken with milk or malt in a social context. In others it was ingested as an experiment or, in one case, as an attempt to marshall enough courage to attend a dance stag.

Every patient became confused, disoriented, and delusional shortly after ingesting the material, with onset of visual and auditory hallucinations and bizarre nonpurposive behavior. The attention of parents or police was soon attracted, and eventuated in emergency-room consultation. Physical examination revealed the classic appearance of atropine poisoning, including widely dilated pupils which reacted poorly to light, dry flushed skin, dry mucous membranes, tachycardia, and delirium. The hallucinations seemed to be nonthreatening. Large hamburgers, pretty girls in telephone booths, a bed rail consisting of a fluorescent tube, a large dead St. Bernard dog in the bed, friends who conversed pleasantly, people in the street removing wheels from a car—these were the scenes hallucinated. Only one patient was in any way obstreperous, arguing at length with his physician. After periods varying from 12 to 48 hours the symptoms abated completely, leaving the patient with little or no recollection of what happened.

With the increasing interest and concern over the use and abuse of the more potent psychotropic drugs, and the continuing debate over the control of their acquisition, some seemingly innocuous preparations may be overlooked. Belladonna, "the deadly nightshade," is no exception. It is an unfortunate addition to a growing list of preparations over the sale of which there seem to be inadequate controls.

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