Epileptic consciousness: Concept and meaning of aura


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Abstract

This research is based on previous publications that have analyzed certain neuropsychological phenomena that always have the same characteristic clinical features: a vivid experience of sudden onset and automatic development, accompanied by an intense sensation of strangeness. When these automatisms are accompanied by only mental symptoms, the designation paroxysmal psychic automatisms (PPAs) is proposed, and they should be interpreted as partial seizures (PSs) with a psychic content whenever they clearly exhibit the four features of suddenness, passivity, intensity, and strangeness. This interpretation is based on the existence of a wealth of scientific literature indicating an overlap between PPAs and PSs; moreover, bibliographic reviews indicate that the clinical signs just defined as characterizing PPAs are precisely those defining the epileptic consciousness.

Keywords: Automatism; Panic attacks; Partial seizure; Paroxysm; Strangeness

1. Introduction

In previous studies [1,2] we analyzed a number of neuropsychological phenomena with very characteristic clinical features that are always repeated in the same unvarying way: suddenness, passivity or automatism, great intensity, and strangeness. These automatisms are sometimes of an exclusively psychic nature, with purely mental manifestations, in which case the designation paroxysmal psychic automatisms (PPAs) is proposed.

Perhaps the best way to explain the type of phenomenon in question is by means of an example of a PPA, which occurs so frequently among the normal population that many of us surely have experienced it: déjà vu, a psychic experience in which a person has the intense conviction of having been through exactly what is happening now in the past. Déjà vu is a paramnesia affecting no less than half of the normal population, and it has the four features we have just described as characteristic of and defining a PPA: it is sudden, completely passively received (automatic), very intense, and charged with an incomprehensible strangeness.

Psychiatric practice recognizes a great variety of psychic phenomena with these clinical features, and in light of their frequency and content, the following list of PPAs may be drawn up:

1. Cognitive automatisms: As well as déjà vu, or false memory, already given as a paradigmatic example, mention may be made of the following:
a. Forced thinking: This involves Penfield’s intellectual aura and is known in psychiatric practice as primary delusional idea [3], where a sudden thought imposes itself on one’s awareness with such force that it gives the impression of certainty and, occasionally, even of clairvoyance.
b. Depersonalization: The subject suddenly has the vivid impression of observing him- or herself as wholly or partially different from normal, despite knowing that
the sense organs are working properly. This experience, on the borderline between the cognitive and the affective, is always accompanied by strangeness and anguish.

c. Derealization: This is similar to depersonalization, but it is the surroundings, not the self, that are suddenly changed.

2. Affective automatisms:
   a. Panic: An attack of anguish and terror suddenly takes over the consciousness with such intensity that the subject has the impression she or he is losing control of the situation, which will have a terrible end, perhaps madness or even death.
   b. Sadness: Here the paroxysmal experience consists of a sudden psychic pain invading the awareness completely and for no apparent reason, the sorrow being inexplicable even for the subject suffering it.
   c. Joy: Joy is the opposite of sadness; it is a state of intense bliss with no apparent cause, and it takes over the consciousness passively for a few short moments, filling it with awe and strangeness.
   d. Alternation of opposite affective experiences: An example is rapid and automatic alternation between joy and sadness.

3. Perceptive automatisms: These are hallucination-like phenomena that suddenly and with great force impose themselves on the consciousness. They are often so intense that they are accompanied by a strong conviction of truth, so they should be considered real delusional hallucinations.

So far, these psychic phenomena have constituted a gray area between psychiatry and neurology, sometimes being diagnosed as symptoms of different psychiatric disorders and sometimes as PSs. Indeed, the mental phenomena just described are often interpreted as symptoms of diverse psychiatric disorders. Hallucinations and primary delusional ideas are two of the characteristic symptoms of acute psychoses, more specifically of an acute thrust of paranoid schizophrenia, and are usually diagnosed as such. In turn, depersonalization and derealization are the essential clinical symptoms of depersonalization disorder. Panic attacks are regularly diagnosed as panic disorder. Painful experiences are often interpreted as symptoms of a melancholic depression, while the opposite joyful experiences are included in the manic phase of bipolar disorder. Finally, rapidly and automatically alternating experiences of joy and suffering are often diagnosed as rapidly cycling bipolar disorder.

All these psychic phenomena may just as easily have an epileptic origin, and they are often diagnosed as epileptic auras. Indeed, Devinsky and Luciano [4] list the following mental manifestations as being of an ictal nature: derealization, depersonalization, dissociation, mystic or religious experiences, forced thinking, distortion of time, déjà vu, jamais vu, fear, depression, anger, pleasure, laughter (gelastic seizures), crying (dacrystic seizures), and visual and auditory hallucinations. For these authors, unlike normal phenomena, which are associated with an appropriate environmental setting or stimulus, ictal emotions are paroxysmal and spontaneous.

For their part, Silberman et al. [5] list the following psychic auras in temporal lobe epilepsies (with the frequency in parentheses): thought and speech disturbances (99%); motor automatisms (86%); hallucinations (71%); sensory illusions and distortions (33%); such cognitive illusions as déjà vu, jamais vu, and illusions of significance (24%); affective paroxysms such as fear, sadness, rage, euphoria, and sexual ones (14%); and time distortions (5%). Finally, Munksgaard [6] offers the following list of PSs with a psychic content: intense, unprecipitated and suddenly remitting episodic affective disturbances involving feelings of anxiety, depression, or rage; suicidal ideation; episodic irritability; and intrusive thoughts.

Through this study we aim to put an end to the lack of diagnostic definition surrounding these psychic phenomena, proposing, when they clearly have the four clinical signs outlined previously (suddenness, automatism, great intensity, and strangeness), that they should be interpreted as simple partial seizures (SPSs) with a psychic content.

2. Methodology

This interpretation is based on reviews of the literature, in which clinical, therapeutic, EEG, and neuroimaging evidence supports the hypothesis of an overlap between PPAs and SPSs. Reviews apart, however, the clinical signs of PPAs mentioned—automatism, suddenness, great intensity, and a strong feeling of strangeness—also happen to be those characterizing and defining the epileptic aura. Therefore, from the point of view of methodology, this study comprises two parts:

1. A bibliographical review of publications in the fields of neurology, psychiatry, and epileptology in search of an overlap between PPAs and epilepsy.
2. A detailed analysis of the concept of aura, which will enable us to highlight the overlap between the clinical signs characterizing the aura and those characterizing PPAs.

3. Epidemiological, clinical, EEG, neuroimaging, and therapeutic data correlating PPAs and epilepsy

The first major argument in favor of an overlap between epilepsy and the aforementioned psychiatric symptoms is their high comorbidity, which has been established for some years. In their epidemiological study on this question, Jallon and Vuilleumier [7] state that the overall incidence of psychiatric disturbances among patients with epilepsy may be reckoned to be around 20–30%.

Moreover, many relevant publications link each of the symptoms we have called PPAs with epilepsy: a wide range of literature relates déjà vu with epilepsy [8–10]. Porter [11]
states that the most normal practice is to interpret déjà vu phenomena as pure and simple cases of SPSs. Panic attacks are also frequently associated with temporal lobe epilepsy; many studies suggest that they should be interpreted as SPSs or, at least, that the two pathologies share a common underlying pathophysiology [12–15]. Sudden and incomprehensible discharges of sadness and moral pain, which have already been mentioned and which often form part of the clinical pattern of melancholic depression, are also linked to epilepsy; some authors suggest that depressive disorders of this type and epilepsy may share common pathogenic mechanisms, facilitating the occurrence of one in the presence of the other [16–20]. The same may be said of the sudden experiences of intense euphoria and hyperactivity typical of the manic phase of bipolar disorder, which are often interpreted as SPSs; a large body of literature defends the epileptic origin of these manic-like states [21–23]. The existence of hallucinations and forced thinking (primary delusional ideas) of an epileptic nature has been well known for a long time; yet, on the other hand, these two psychic phenomena are characteristic symptoms of acute psychoses. So it should come as no surprise that different authors should postulate the existence of common etiopathogenic mechanisms for epilepsy and acute psychoses, and that there should be an abundant bibliography indicating an overlap of these ictal psychoses and different acute psychotic disorders [24,25]; one author [26] even suggested that a certain number of schizophrenic-like psychoses are produced by temporal lobe seizure activity.

Another argument supporting the superposition of psychiatric disorder and epilepsy is the weight of literature stressing that EEG disturbances are more frequent in patients with the mental manifestations we have termed PPAs than in the general population [27–31], and there are many specific references to electroencephalographic signs suggestive of epileptic activity [32].

Likewise, different neuroimaging techniques have contributed evidence of an overlap between PPAs and epilepsy [33–36]. Structural and functional imaging studies show that the areas of the brain involved in such mental manifestations are indeed the most strongly epileptogenic areas of the cortex, which are, moreover, those most closely linked with SPSs with a psychic content: the amygdala, the hippocampus, and the limbic circuit [37–39]. Many of these studies specify that the mental manifestations in question could be due to an epileptogenic mechanism such as kindling [40–43].

There are also therapeutic arguments indicating an overlap between epilepsy and different psychiatric disorders, as the same treatments are effective for both pathologies. Indeed, a body of pharmacological evidence supports the hypothesis set out here regarding the overlap between PPAs and SPSs. First, there are many references to the fact that what we call PPAs respond well to antiepileptic drugs; many scientific publications defend their usefulness in the treatment of panic attacks [44–46], monopolar and bipolar depression [47–50], etc. Second, there is also a body of evidence supporting a complementary argument: more and more authors, contrary to conventional attitudes, defend the anticonvulsant role of the drugs used in psychiatry to treat PPAs. There are an increasingly large number of references pertaining not only to selective serotonin reuptake inhibitors [51–55] but also to tricyclic antidepressants [56–58], these being the two groups of drugs used in the treatment of such symptoms as panic attacks, depressive symptoms, depersonalisation, and derealization.

But not only psychopharmacological drugs are effective for psychiatric disorders and epilepsy; the same is true for other biological treatments, as both electroconvulsive therapy [59,60] and transcranial magnetic stimulation [61] appear to be equally effective in the treatment of both pathologies.

4. The concept of epileptic aura

The second argument to support our hypothesis is the overlap between the clinical signs characterizing and defining the epileptic aura and those defining PPAs. To clarify this point, it has been necessary to review the concept of aura, which has meant a detailed search in the literature of several neuroscience disciplines, mainly epileptology, neurology, psychiatry, and psychopharmacology. The review involved both modern [5,62–69] and classic [70–72] publications, since we have found studies from the early and middle years of last century whose validity has not been superseded.

The term aura was first introduced into medical vocabulary by Galen in the second century of our era [73], and in 1981 the Commission on Classification and Terminology of the International League Against Epilepsy defined it as “that portion of the seizure which occurs before consciousness is lost and of which memory is retained afterwards” [74].

This definition has been a source of controversy because of its lack of precision as it relies totally on the fact that the patient has not yet lost consciousness. So, it would seem that anything happening during an epileptic seizure should be interpreted as part of the aura, provided that consciousness is preserved and it stays in the patient’s memory. That being the case, the terms simple partial seizure (which by definition occurs without affecting consciousness) and aura are synonyms, as many authors do in fact maintain. On the basis of the criterion that aura is equal to SPS, it would be correct to speak of motor auras, sensory auras, visceral auras, and vegetative auras, as indeed is the case in many texts on epilepsy.

Nevertheless, many specialists argue that the concept of aura should be exclusively reserved for the psychic experience occurring during a partial seizure. Probably the most forthright author in this regard is the famous British neurologist Samuel Kinnier Wilson, for whom Wilson’s disease is named. He specifically warns us in his Modern Problems in Neurology that “the aura is nothing else than the first conscious indication of the commencement of a

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process that is about to exteriorize itself by signs of the physical series, though it belongs to the psychic series” [72].

The aura, therefore, is only the psychic experience occurring as a consequence of the triggering of certain epileptic seizures; it does not include all the symptoms of the attack. So, aura refers exclusively to a “psychic thing” [72] and, because of this, the Task Force on Classification and Terminology recently changed the definition of the aura, proposing: “a subjective ictal phenomenon that in a given patient may precede an observable seizure; if alone, constitutes a sensory seizure” [75].

So far we have seen the concept of aura now current in epileptology. Now, classic psychopathological studies carried out in the 19th and 20th centuries on the epileptic consciousness, though stating likewise that the aura is the psychic experience indicating that an epileptic seizure has just begun, go further and qualify the definition, specifying what the psychic experience of the aura actually consists of. Indeed, according to the definition currently used in epileptology, any kind of psychic experience occurring during a SPS forms part of the aura, so SPSs with a psychic content and SPSs with an aura are synonymous. Nevertheless, in classic psychopathological studies, aura refers only to a concrete psychic experience occurring during the SPS.

To clarify this point, we refer to Henri Ey’s magnificent study of epilepsy set out in his Études Psychiatriques, where the illustrious French psychiatrist clearly states that aura does not include every psychic experience during an SPS, but only a very specific one manifesting itself always in the same invariable manner, as Ey’s patients remark [70]: “I feel something weird,” “It’s like a strange gust of wind,” and “something bursts in and imposes itself totally.” This brief description includes the four main phenomenological features that permit us to define the aura as a sudden experience of strangeness that appears passively and manifests itself in all its intensity from the outset. This paroxysm is always felt as something unusual and extraordinary has just been set off in the mind: “like a strange world suddenly bursting in on the familiar one,” states Ey [70]. So, the strangeness of the aura always implies an unprecedented and surprising experience that does not respond to understandable mechanisms. This sudden experience of strangeness is immediately followed by different physical or psychic manifestations, which constitute the true symptoms of the partial discharge that has just begun. These subsequent automatic manifestations, whether psychic or physical, are not properly the aura itself, but their automatic nature contributes to its characteristic feature of strangeness.

This paroxysm of strangeness is the sign, on the psychic level, of the alteration undergone by the consciousness as a consequence of the onset of an epileptic attack, as Ey [70] states explicitly: “The aura supposes a structural alteration of the consciousness in that the elements making up the scene lose their unity and their mutual relationships. The axial syndrome of the epileptic aura is made up of these disturbances of consciousness, which are more or less inseparable from disturbances of attention.”

Therefore, in the light of these psychopathological studies, the definition of aura may thus be formulated in these terms: the aura is the qualitative disturbance undergone by the consciousness as a consequence of the onset of a partial epileptic seizure, and is experienced as an intense paroxysm of strangeness accompanying the automatic manifestations of the seizure.

Much research has been done and much has been published [76–79] concerning the localizing value of the aura, that is, the clinical content of the psychic experience constituting the aura may be useful in determining the site of the attack. After retrospective and prospective trials, Palmini and Gloor [76] concluded that the type of aura, when elicited by careful history taking, provides localizing, but often not lateralizing, information as useful as an EEG or such modern high-technology procedures as CT, MRI, and PET. For their part, Fried et al. [77] state that epigastric auras as well as gustatory and olfactory auras are significantly more frequent in patients with hippocampal sclerosis, whereas auras of vertigo or dizziness occur more often in patients with extratemporal pathology. Janati et al. [78] consider that the aura has, at most, a limited relationship to lateralization or localization of interictal cerebral dysfunction in complex partial seizures (CPSs). Experiential auras are almost exclusively seen in patients with a temporal lobe seizure focus [65], and it seems that these psychic auras are more frequently associated with right-sided temporal lobe lesions [79].

The comparative analysis of aura and PPAs carried out so far has revealed so many similarities and overlaps between the two pathologies that it is now very easy to understand Manchanda and co-workers’ proposition [65]: “The psychosensory features—including paroxysmal, brief, sensory (e.g., perceptual distortion), emotional (e.g., intense euphoria or sadness), and cognitive (e.g., forced thinking) disturbances—seen in CPSs as well as in major psychiatric disorders such as schizophrenia, schizoaffective disorders, and bipolar mood disorders, are considered to be temporolimbic in origin and suggest temporal lobe dysfunction.”

5. Discussion

Now, the preceding definition of aura, based on the presence of the four objective signs we described, constitutes a very valuable clinical tool, especially useful for diagnosing the psychic manifestations for which we proposed the denomination PPAs at the beginning of this article. Close observation will immediately reveal that PPAs are symptomatic manifestations of SPSs with an exclusively psychic content, for which it has been difficult to make the right diagnosis up to now. Indeed, most SPSs pose no diagnostic difficulty because the characteristic experience of strangeness of the aura is followed by the physical symptoms of seizure, whether motor, sensory, vegetative, or
whatever, as these physical symptoms are indicative of epilepsy. But, in SPSs with an exclusively psychic content, the experience of strangeness is followed only by other psychic experiences, which makes it more difficult to diagnose epilepsy.

Furthermore, the psychopathological definition of aura that interests us here implies the need to review the criterion used thus far in the differential diagnosis of SPSs and CPSs, which has proved to be of little or no real use, and to replace it with a more operational one. Thus far, the criterion followed is one of preserved consciousness during SPSs and impaired consciousness in CPSs. Now, the level of consciousness during PSs is often difficult to determine, even on review of high-quality videotapes, as Wylie and Lüders [80] emphasize. Because of this difficulty, “it is common practice to classify as ‘complex partial’ all seizures that usually are associated with loss of consciousness (e.g., partial seizures with staring and unresponsiveness) and as ‘simple partial’ all seizures that usually involve preserved consciousness (e.g., seizures with focal motor features), whether or not the actual level of consciousness is known.”

Therefore, in clinical practice little notice is being taken of the criterion for differentiation between SPSs and CPSs because of the difficulty in differentiating between preserved and impaired consciousness. This questionable diagnostic procedure could be avoided if diagnosis were based on the psychopathologic concept of epileptic consciousness set out here. It has already been pointed out that in psychopathology, epileptic consciousness is by definition always different from normal consciousness, as is oniric, or hypnoid, consciousness. Therefore, in psychopathology, consciousness is affected in any kind of attack, including a SPS. According to the psychopathological approach, then, although the consciousness is disturbed in both SPSs and CPSs, the former occur with an exclusively qualitative alteration of the consciousness, while the latter imply also a quantitative reduction.

In fact, different authors have been postulating the need for neurology and epileptology to establish this differentiation between qualitative and quantitative alterations to consciousness already contemplated in psychopathology. It is precisely on these lines that Monaco et al. [81], in an interesting recently published study, post the appropriateness of establishing criteria for objectifying the qualitative alteration of consciousness. Well, here we propose that the four clinical signs so often mentioned in this article should serve as defining criteria of the qualitative alteration undergone by the epileptic consciousness during a SPS. These four clinical signs could be quantified if the appropriate clinical scales were drawn up.

6. Conclusion

We are now tempted to define aura as a sudden experience of strangeness overcoming consciousness that indicates the beginning of a partial seizure. This partial discharge will give rise to manifestations, either physical or psychic, but always experienced with very great intensity and in a completely passive or automatic way. The presence of the four signs (suddenness, passivity or automatism, great intensity, and strangeness) constitutes a useful clinical tool for arriving at a differential diagnosis between epilepsy and psychiatric disorder, which proves especially difficult in SPSs of exclusively psychic content. Furthermore, these four clinical signs may be used as quantifiable criteria in determining the qualitative alteration undergone by consciousness during SPSs.

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