Clinical aspects and severity of acne: Example of teen acne

Acne is a chronic inflammatory disease of the pilosebaceous follicle that involves three factors: excessive sebum production, abnormal keratinization of the pilosebaceous follicle and an anaerobic bacterium, Cutibacterium acnes. Cutibacterium acnes, along with the microbiome and innate immunity, is a key contributor to the development and maintenance of the local inflammatory response. Innate immunity plays an important role in its development and acne is therefore classed as a “multifactorial chronic autoinflammatory disease.”

In this review of clinical acne lesions and the quantification of their severity, we will take as an example the most common form: “acne vulgaris.”

Epidemiology of teen acne

Teen acne is very common, affecting 80% of the population between the ages of 12 and 20. A French study conducted in 1996 in a sample of 913 patients aged between 11 and 18 showed a prevalence of 76%, peaking between 14 and 16 in girls and a little later (16-17) in boys (1).

This data is fairly similar to that of other European countries and elsewhere in the world. A familial factor is found in more than 50% of cases.

Clinical signs of acne

Seborrhea

Seborrhea is the first manifestation of acne and appears at puberty. It is characterized by a shiny appearance of the skin, predominantly in the mid-facial area (forehead, tip of the nose, cheeks and chin). The pores of the skin often appear dilated. Clinical noninflammatory lesions appear very quickly.

Retentional lesions

They consist of open (blackheads) or closed comedones (microcysts) (Figures 1 and 2). The open comedo is a hard plug measuring 1 to 3 mm in diameter composed of sebum and keratin which obstructs the infundibular orifice. The blackened external apex corresponds to an agglomerate of oxidized fats and keratinocytes from the infundibular epithelium.

The closed comedo is a whitish papule 2 to 3 mm in diameter, caused by an accumulation of sebum and keratin in an infundibulum whose orifice is closed. It may develop into an open comedo.

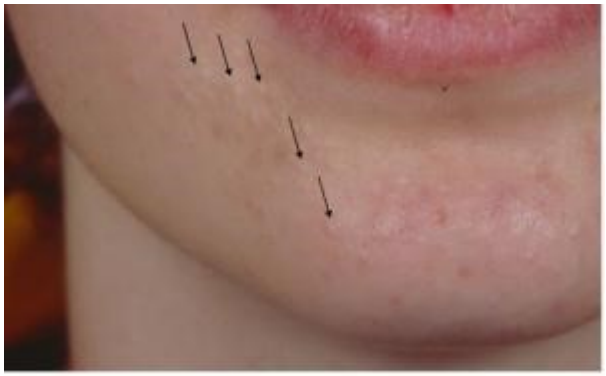


Figure 1: Closed comedones



Figure 2: Open comedones

Superficial and deep inflammatory lesions

A papule is an inflammatory lesion that can appear de novo or as a result of inflammation of a closed or open comedones. It is a hard, red, sometimes painful bump that is either spontaneously resorbed or develops into a pustule or nodule (Figures 3, 4, 5).



Figure 3: Papules

A pustule is a papule containing a purulent accumulation of granulocytes at its apex.



Figure 4: Pustules

The definition of nodule varies from country to country according to its size: larger than 5 mm in France, larger than 4 mm in the USA, equal to or larger than 6 mm in Great Britain and 8 mm in Scandinavia.

These nodules may be open externally, and may sometimes form fistulas and rupture within the dermis. They then give rise to inflammatory pseudocysts, abscesses which can merge into a sinus, fluctuant elongated inflammatory lesions often localized in the nasolabial folds. Nodules often develop into an atrophic, hypertrophic or keloid scar.



Figure 5: Nodule

Scars

Acne scars are secondary lesions and represent the final stage in the course of inflammatory acne lesions. They are all the larger if the inflammatory lesions are severe with a prolonged course. Delays in treatment promote their development (Figure 6).

Erythema and pigmentation are not considered as scars as they generally resolve. Pigmentation intensity is linked to phototype.

Several classification systems have been proposed for atrophic and hypertrophic scars. Among these is a French system which is easy to use in practice and which has the advantage of being quantitative. It classes atrophic lesions as V-shaped (ice pick), U- or W-shaped lesions (2).

Elastolysis forms a 1 to 2 mm white scar in a whitish bulge, caused by the loss of elastic tissue around the pilosebaceous follicle under the action of enzymes produced during the inflammatory response.



Figure 6: Acne scars

Spread of acne beyond the face

Acne can spread to the neck and trunk (Figure 7) in areas containing a high density of sebaceous glands (around the sternum, upper back, lateral surface of the arms). Acne on the trunk is more common and more severe in boys.

Spread of lesions to the lower back is a negative sign, often associated with a more difficult treatment of acne.



Figure 7: Acne of the trunk

What can be expected from a clinical examination?

The clinical examination enables the diagnosis of acne to be confirmed, in general very quickly, if the clinician does not fall into the differential diagnosis trap.

The medical history should include the date of onset, progression, whether there is a history of acne in the parents and siblings, treatments already used and their results, whether other medications are being taken, in particular hormonal medications (pill), make-up and cleansing practices.

The thorax must be examined as well as the face. Adolescents do not like undressing.

Palpation enables a papule to be distinguished from a temporary cicatricial erythema, and nodules and their level of infiltration to be identified. Finally, pulling up the skin between two fingers will give improved detection of closed comedones particularly on either side of the dimple in the chin.

The clinical examination serves as a guide for treatment. lt must:

- **Determine the predominant type of basic lesion** (retentional, superficial inflammatory, nodular), fundamental to the choice of treatment
- **Assess lesion spread**

It serves to identify factors predictive of a risk of severe acne or acne that is more difficult to control with treatment (3)**:**

- **the concept of "familial" acne,**

- **severe seborrhea,**

- **spread of lesions to the lower back,**

- **early or late onset of acne.**

Quantitative assessment of acne severity

Counting of retentional and inflammatory lesions

This more precise method still takes too long to be used in daily practice and is reserved for clinical research. Retentional lesions are harder to identify, so they are associated with poor interobserver and even intraobserver reproducibility. Photographic approaches also remain difficult because of different methods, and are used only in clinical research.

Global scales for grading acne activity

The French GEA scale has been published with an approved English translation (Global Acne Severity Scale) (Table I). It offers good intraobserver and interobserver reproducibility (4). For example, it is used in good practice guidelines in France to indicate treatments according to the stage of acne severity (5).

Grade	Global assessment	Description

0	Clear	Possible presence of residual pigmentation and erythema.
1	Almost clear	A few rare open or closed comedones and papules.
2	Mild	Easily identifiable: less than half of the face is affected. Some open or closed comedones and some papulopustules.
3	Moderate	More than half of the surface of the face is affected: numerous papulopustules, numerous open or closed comedones. Possible presence of a nodule.
4	Severe	The whole face is affected, covered with numerous papulopustules, open or closed comedones and some rare nodules.
5	Very severe	Very inflammatory acne covering the face with nodules.

Table 1: Grading of acne severity (5)

A global grading scale for the severity of chest acne has recently been published: the TRASS (truncal acne severity scale) (6). Unlike conventional scales, the TRASS not only assesses the presence, type and surface area of lesions, but also takes into account family history, disease and treatment history, as well as the patient's mental and physical well-being.

Quality of life scales

We must not forget that, because of its presence on the face and the frequent scars it causes, acne is a source of psychological stress. Acne is one of the diseases having the most significant impact on the quality of life of patients and cuts them off from those close to them.

There is not always a correlation between the severity of acne lesions and their psychological impact. There are scales to evaluate this impact.

There are numerous scales, including the **Quality of Life Index** (DLQI questionnaire) (for the French version: http://medicalcul.free.fr/dlqi.html; for the English version: https://www.bad.org.uk/shared/get-file.ashx?id=1653&itemtype=document) (7), which is a global quality of life scale, and the CADI (Cardiff Acne Disability Index), which has the advantage of containing few questions and is therefore easy to use (8).

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