A fly swatting campaign was instituted and the anti-spitting law (including the streets) was rigidly enforced.

CONCLUSION

Every force, medical, sanitary and civic, must be mobilized to meet this disease.

Are preventive measures of material help? It is of course impossible except by comparison to judge the number of cases that might have occurred had not active measures been instituted. The relatively larger number of cases in other cities indicates so far that active measures are important.

GASTRO-INTESTINAL FINDINGS IN ACNE VULGARIS

ESPECIALLY FLUOROSCOPIC *

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It is generally recognized that the acne bacillus is the direct cause of acne vulgaris; yet there are a number of associated conditions which the patients often show that are regarded as predisposing factors. Among these may be mentioned puberty, anemia, and utero-ovarian and gastro-intestinal disorders. Varying degrees of emphasis have been placed on these factors in their relation to acne by different authors and investigators. Probably those which have received the most attention are the gastro-intestinal affections; but the observations have been mostly of a clinical nature.

One of the earliest investigators in this line was Barthelemy,¹ who, in 169 cases of acne, found clapping in all but four cases. According to this author acne does not exist without dilatation of the stomach.

Mitour² examined thirteen patients with acne, seven of whom had dyspepsia, and the gastric contents showed an increase in the acids of fermentation. He defined the dyspepsia which is present in acne as that type which is characterized by distention and fermentation of the stomach accompanied by considerable variation in the gastric hydrochloric acid content.

Bach³ examined 128 cases of acne in women for hemoglobin content of the blood, female disorders, and gastro-intestinal derangements. Only the gastro-intestinal disorders showed a higher percentage in the acne patients than in the control of cases, of which there were sixty-two.

White⁴ found digestive disturbances in 59 per cent. of 438 cases of skin diseases. The percentage, however, in the acne cases alone was only 55, which was somewhat lower than the general average.

Other lines of investigation, as those of Kapp,⁵ who found in thirty-three cases of acne the presence of indol in the urines of all the patients, have suggested that there is a toxic protein decomposition in many

cases of acne which is most likely dependent on intestinal stasis.

At the suggestion of Dr. Gilchrist, we thought that more definite information might be obtained as to the nature of the gastro-intestinal disorders accompanying acne, by fluoroscopy of the gastro-intestinal tracts of acne patients. This method of investigation, which as far as we know has not been carried out before in this disease, would be of especial value in determining if an anatomic basis existed in these patients which would permit protein decomposition and toxic absorption. Besides the fluoroscopy of the gastro-intestinal tracts, the patients also received test meals, and analysis of the gastric contents was made.

METHOD

1. *Gastric Analysis.*—(a) Fasting Stomach: Patients were given 6 tablespoonfuls of boiled rice at 9:30 p. m. Nothing was taken by mouth after this. The contents of the stomach were removed at 9 o'clock on the following morning and examined for amount, presence of free hydrochloric acid and occurrence of rice retention as evidenced by Hausmann's test and microscopic examination after staining for starch with iodine.

(b) Test Breakfast: After removal of the contents of the fasting stomach the patients were given two small slices of bread and about 250 c.c. of water. This was removed one hour later. The total and free acidity were titrated and expressed in cubic centimeters of tenth normal sodium hydroxid per hundred c.c. of the gastric fluid removed.

2. *Fluoroscopic Examination.*—Patients were given 1 ounce of bismuth subcarbonate in a glass of water at 5 p. m. on the day prior to examination. Eighteen hours later a second dose of the same amount was given just before the patients were examined by the fluoroscope. All the patients were examined in the upright position.

DEFINITIONS

1. Normal gastric acidity: Total acidity, from 40 to 60; free acidity, from 20 to 40.

2. Retention: The presence of rice granules in the contents of the fasting stomach denotes retention. When distinguishable to the naked eye, as shown by Hausmann's test, it denotes a greater degree of retention than when only apparent after microscopic examination.

3. Secretion: Any amount of fluid above 25 c.c. obtained from the fasting stomach was considered abnormal.

4. Position of the stomach: Ptosis was considered to be present only when the lower level of the stomach was below the level of the crest of the ilium.

5. Position of the colon: Ptosis of the colon was considered to be present when it lay below the level of the crest of the ilium. When the transverse colon lay on the floor of the pelvis, the maximum grade of ptosis was considered to be present.

All of the material was taken from the skin clinic and was not selected. The following thirty cases were examined in the gastro-intestinal department under the supervision of Dr. Brown:

CASE RECORDS

CASE 1.—Boy, aged 15. Acne medium, duration six months. Has had pain in stomach for the past two or three years after meals. Constipated. (1) Gastric examination: Fasting stomach; 25 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative.

* From the dermatologic and gastro-intestinal departments of the Johns Hopkins University.

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Barthelemy: Arch. gén. de méd., 1889.

2. Mitour: Etude sur la nature et le traitement de la dyspepsie accompagnée d'acné, Thèse de Paris, 1896.

3. Bach: Klin. therap. Wchnschr., 1907, Nos. 35, 36, 37.

4. White: Boston Med. and Surg. Jour., 1907, vii, 225.

5. Kapp: Therap. Monatsh., 1907.

Test breakfast; 70 c.c.; free hydrochloric acid, 10; total acid, 41. (2) Roentgen examination: Stomach large and atonic. Cecal stasis and prolapse of the transverse colon.

Summary.—Hypochlorhydria. Ptosis and atony of the stomach. Ptosis of the colon. Cecal stasis.

CASE 2.—Girl, aged 17. Acne mild, duration six months. No history of gastric disturbances. Bowels regular. (1) Gastric examination: Fasting stomach; 40 c.c.; free hydrochloric acid present, Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 130 c.c.; free hydrochloric acid, 36; total acid, 56. (2) Roentgen examination: Stomach in good position, slightly atonic. Intestines normal.

Summary.—Practically normal findings (except slight gastric atony).

CASE 3.—Negro woman, aged 30. Acne medium, duration five or six years. Patient often has a tight feeling in the stomach and belches sour food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 20 c.c.; Hausmann's test positive. Microscopic examination: Starch positive. Free hydrochloric acid present. Test breakfast; 80 c.c.; free hydrochloric acid 27; total acid, 44. (2) Roentgen examination: Stomach high. Slight prepyloric bulging. Motor function normal. Prolapse of the hepatic flexure. On deep inspiration prepyloric region pulled out, suggesting loose lower right quadrant adhesions.

Summary.—Spastic pylorus with slight retention, due to a reflex spasm from right lower quadrant adhesions. Prolapse of hepatic flexure.

CASE 4.—Girl, aged 20. Acne medium, duration six years. Patient often belches sour food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 55 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 20 c.c.; free hydrochloric acid, 4; total acid, 24. (2) Roentgen examination: Stomach dilated, three fingers' breadths below crest of the ilium. Congenitally fixed duodenum. Sluggish peristalsis.

Summary.—Gastric atony and stasis. Hypochlorhydria.

CASE 5.—Girl, aged 18. Acne medium, duration two years. Often has hiccups and a sour taste after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 45 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 77 c.c.; free hydrochloric acid, 40; total acid, 72. (2) Roentgen examination: Stomach just below crest of ilium. Normal size. Hyperperistalsis and motility. Prepyloric bulging. Moderate prolapse of hepatic flexure which is pulled over to pyloric region, then drops down to the left iliac fossa, thence irregularly up to the splenic flexure, which is in good position.

Summary.—Hyperacidity and slight hypersecretion. Hyperperistalsis and motility. Suggests irritative lesion in the pyloric region, possibly duodenal ulcer. Pelvic adhesions.

CASE 6.—Boy, aged 15 years. Acne mild, duration two months. No gastric symptoms. Bowels regular. (1) Gastric examination: Fasting stomach; 84 c.c.; free hydrochloric acid present; Hausmann's test positive. Microscopic examination: Starch positive. Test breakfast; 100 c.c.; free hydrochloric acid, 23; total acid, 37. (2) Roentgen examination: Stomach very large, three fingers' breadths below crest of ilium. Markedly increased peristalsis; bismuth going over rapidly into duodenum. Some prepyloric bulging. Prolapse of the transverse colon.

Summary.—Irritative lesion in pyloric region with gastric retention and ptosis of transverse colon.

CASE 7.—Boy, aged 19. Acne medium, duration one year. For the past three months has had colicky pains in the stomach with no reference to meals. Has been constipated for the last three months. (1) Gastric examination: Fasting stomach; 16 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 23 c.c.; free hydrochloric acid, 29; total acid, 60. (Stool shows occult blood.) (2) Roentgen examination: Stomach, fair position; hyperperistalsis; hypermotility. Large intestine in good position.

Summary.—Hyperactive stomach. Irritative lesion in region of duodenum, probably ulcer.

CASE 8.—Woman, aged 21 years. Acne severe, duration three years. Patient complains of full feeling in stomach after meals and is constipated. (1) Gastric examination: Fasting stomach; 5 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 17 c.c.; free hydrochloric acid, 20; total acid, 44. (2) Roentgen examination: Stomach, fish-hook type, three fingers' breadths below crest of ilium. Normal peristalsis, hypermotility; cecal stasis. Hepatic flexure and ascending colon kinked back on cecum; prolapse of the transverse colon.

Summary.—Prolapse of the stomach and colon. Right lower quadrant adhesions. Hyperchlorhydria. Fecal stasis. Condition suggests chronic appendix with hyperactive stomach.

CASE 9.—Boy, aged 16. Acne severe, duration one year. No gastric symptoms except belching of sour food occasionally after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 58 c.c.; free hydrochloric acid, 12; total acid, 35. (2) Roentgen examination: Stomach practically in normal position, slightly on the right side. No cecal stasis. Segmentation of the transverse colon. Bismuth mostly in the rectum.

Summary.—Intestinal picture of mucous colitis; hypoacidity.

CASE 10.—Girl, aged 19. Acne mild, duration five years. No gastric symptoms; bowels regular. (1) Gastric examination: Fasting stomach; 22 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: A few starch granules present. Test breakfast; 25 c.c.; free hydrochloric acid, 37; total acid, 51. (2) Roentgen examination: Stomach normal in size and position; no cecal stasis, marked ptosis of the transverse colon, which reaches to the bottom of the pelvis. Marked redundancy and atony of the transverse colon.

Summary.—Marked ptosis of transverse colon; fecal stasis.

CASE 11.—Woman, aged 23. Acne severe, duration one year. No symptoms referable to gastro-intestinal tract; bowels regular. (1) Gastric examination: Fasting stomach, 45 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch negative. Test breakfast; 135 c.c.; free acid, 18; total acid, 43. (2) Roentgen examination: Stomach posed nearly to bottom of pelvis, atonic with sluggish peristalsis. Cecal stasis.

Summary.—Ptosis and atony of stomach; hypersecretion; hyperchlorhydria; fecal stasis.

CASE 12.—Boy, aged 18. Acne medium, duration one year. No gastro-intestinal symptoms. Bowels regular. (1) Gastric examination: Fasting stomach empty. Test breakfast; free hydrochloric acid, 14; total acid, 24. (2) Roentgen examination: Stomach large, atonic, at level of crest of the ilium; poor peristalsis and motility; stomach pulled somewhat down into the lower right quadrant; moderate cecal stasis; prolapsed spastic transverse colon.

Summary.—Right lower quadrant adhesions; fecal stasis; atony of the stomach and hyperchlorhydria; probably a chronic appendicitis.

CASE 13.—Man, aged 21. Acne medium, duration five years. No gastro-intestinal symptoms; bowels constipated. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: Starch positive. Test breakfast; 80 c.c.; free hydrochloric acid, 28; total acid, 31. (2) Roentgen examination: Stomach two fingers' breadths below the crest of the ilium. Good peristalsis and motility. No cecal stasis; most of the bismuth in descending colon and rectum.

Summary.—Practically normal finding with slight gastrop-tosis.

CASE 14.—Boy, aged 15. Acne medium, duration two years. Patient often has fullness of stomach and shortness of breath after eating fried food. Bowels regular. (1) Gastric examination: Fasting stomach; 12 c.c.; free hydrochloric acid negative; Hausmann's test negative. Microscopic examination: Starch positive. Test breakfast; 20 c.c.; free hydro-

chloric acid, 4; total acid, 8. (2) Roentgen examination: Stomach to level of crest of ilium; normal size, good tone. Pylorus pulled down to right lower quadrant; cecal stasis. Ascending and first part of transverse colon kinked back on cecum. Pyloric and cecal regions move *en masse*. Ptosis of transverse colon.

Summary.—Right lower quadrant adhesions; fecal stasis; marked subacidity; suggests chronic appendicitis.

CASE 15.—Boy, aged 19. Acne medium, duration three years. Occasionally spits up sour food after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; Hausmann's test negative. Microscopic examination: Starch positive. Free hydrochloric acid present. Test breakfast; free acid, 5; total acid, 17. (2) Roentgen examination: Stomach good position; vertical type; reaches to the crest of the ilium; good peristalsis and motility. Vertical duodenal cap; definite cecal stasis; ptosis of hepatic flexure with kinking back of ascending and transverse colon on cecum; fixation of cecum. Spastic transverse colon.

Summary.—Subacidity marked; fecal stasis and spastic transverse colon.

CASE 16.—Boy, aged 13. Acne medium, duration one and one-half years. Patient often spits up sour food after meals. Bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test negative. Microscopic examination: A few starch granules present. Test breakfast; 25 c.c.; free hydrochloric acid, 22; total acid, 36. (2) Roentgen examination: Stomach three fingers' breadths above the crest of the ilium, normal size, slightly atonic; cecal stasis; pylorus pulled down and to the right. No evidence of definite adhesions in cecal region. Large amount of bismuth in cecal region.

Summary.—Slight subacidity; fecal stasis.

CASE 17.—Boy, aged 14. Acne mild, duration six months. No gastric symptoms; bowels regular. (1) Gastric examination: Fasting stomach; 10 c.c.; free hydrochloric acid present; Hausmann's test positive. Microscopic examination: starch positive. Test breakfast: 40 c.c.; free acid, 35; total acid, 52. (2) Roentgen examination: Stomach normal sized, pylorus drawn down into right lower quadrant; increased peristalsis, cecal stasis, ascending colon kinked back on cecum. Transverse colon in good position.

Summary.—Right lower quadrant adhesions with hyperactive stomach suggesting chronic appendicitis; fecal stasis.

CASE 18.—Man, aged 21. Acne medium, duration three years. Patient often belches up sour food after meals and occasionally after eating meats he has pains in the right side. Bowels regular. (This patient also has a vesicular eczema on hands, of three weeks' duration.) (1) Gastric examination: Fasting stomach; 25 c.c.; free hydrochloric acid present; Hausmann's test positive. Microscopic examination: Starch positive. Test breakfast: 110 c.c.; free hydrochloric acid, 34; total acid, 51. Roentgen examination: Hypermotility and hyperperistalsis of stomach; pylorus pulled over to right and downward; moderate cecal stasis. Hepatic flexure pulled over to prepyloric region, then back on cecum and up to splenic flexure.

Summary.—Right lower quadrant adhesions suggesting chronic appendicitis; hypermotility of stomach, moderate fecal stasis.

CASE 19.—Girl, aged 15. Acne mild, duration two years. Patient occasionally spits up sour food after meals, and has a feeling of fullness in epigastrium. (1) Gastric examination: Fasting stomach; 15 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 90 c.c.; free hydrochloric acid, 24; total acid, 51. (2) Roentgen examination: Stomach normal sized, with marked increase in peristalsis; pylorus pulled down to right lower quadrant.

Summary.—Chronic appendicitis.

CASE 20.—Woman, aged 21. Acne mild, duration eight years. Patient occasionally has "heart burn" and a feeling of fullness after meals. Bowels constipated unless she takes medicine regularly. (1) Gastric examination: Fasting stomach; 35 c.c.; free hydrochloric acid present; Hausmann's

test and microscopic starch negative. Test breakfast: 75 c.c.; free hydrochloric acid, 25; total acid, 40. (2) Roentgen examination: Stomach normal in size; in good position with slight tendency to hour glass type. At junction of middle and upper third there is a slight prepyloric bulging. Vertical duodenal cap present. Moderate cecal stasis. Ascending colon kinked back on cecum and drawn down to prepyloric region. Colon in good position.

Summary.—Periceal adhesions with reflex spastic stomach; fecal stasis; suggests a high chronic appendicitis with probable pylorospasm.

CASE 21.—Woman, aged 21. Acne mild, duration two years. Patient often has "heart burn" and belches sour food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 5 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 50 c.c.; free hydrochloric acid, 30; total acid, 17. (2) Roentgen examination: Stomach normal size, reaching just to crest; vertical fishhook type. Orthotonic; good peristalsis and motility. No cecal stasis. Most of bismuth in sigmoid and rectum. Very slight ptosis.

Summary.—Subacidity; slight ptosis.

CASE 22.—Boy, aged 18. Acne severe, duration three years. No gastric symptoms. Bowels regular. (1) Gastric examination: Fasting stomach; 25 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 125 c.c.; free hydrochloric acid, 42; total acid, 62. (2) Roentgen examination: Stomach to level of crest; vertical fishhook type; slightly atonic; sluggish peristalsis and motility. Pylorus ptosed. Cecal stasis. (Rest of picture not made out, as patient's bowels had moved.)

Summary.—Gastroptosis with atony; fecal stasis; slight hyperacidity.

CASE 23.—Girl, aged 20. Acne severe, duration five years. Has had indigestion for a number of years. Has feeling of fullness and belches food after meals. Bowels constipated. (1) Gastric examination: Fasting stomach; 40 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: free hydrochloric acid, 6; total acid, 18. (2) Roentgen examination: Stomach dilated, atonic and ptosed a hand's breadth below crest of ilium. Marked prolapse of the transverse colon. Considerable bismuth in rectum.

Summary.—Splanchnoptosis, with atony of stomach and marked subacidity; fecal stasis.

CASE 24.—Boy, aged 18. Acne medium, duration two years. No gastro-intestinal symptoms. Bowels move daily. (1) Gastric examination: Fasting stomach: 20 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch negative. Test breakfast: 10 c.c.; free hydrochloric acid, 29; total acid, 40. (2) Roentgen examination: Stomach normal size, reaching to crest, vertical type; lateral duodenal cap. Increased peristalsis and motility. Moderate cecal stasis and ptosis of transverse colon. Bismuth seen going over in large quantities into duodenum.

Summary.—Hypermotility of stomach; ptosis of transverse colon; fecal stasis; possible irritative duodenal lesion.

CASE 25.—Girl, aged 25. Acne mild, duration three years. Patient often has a sour stomach and belches after meals. Bowels constipated. (1) Gastric examination: Fasting stomach (lost). Test breakfast: 90 c.c.; free hydrochloric acid, 26; total acid, 60. (2) Roentgen examination: Baglike, atonic stomach. Ptosis of stomach and intestines. Kinking of the ascending colon and hepatic flexure.

Summary.—Ptosis and atony of stomach and intestines; fecal stasis.

CASE 26.—Girl, aged 20. Acne medium, duration one year. No gastro-intestinal symptoms. Bowels regular. (1) Gastric examination: Fasting stomach: 20 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch positive. Test breakfast: 110 c.c.; free hydrochloric acid, 13; total acid, 41. (2) Roentgen examination: Stomach in good position. Cecal stasis. Hepatic flexure bent back on cecum forming an angle. Prolapse of the transverse colon.

Summary.—Prolapse of transverse colon; cecal stasis; subacidity.

CASE 27.—Girl, aged 18. Acne mild, duration five months. Patient occasionally belches sour food and has cramps in stomach after meals. (1) Gastric examination: Fasting stomach: free hydrochloric acid present; Hausmann's test and microscopic starch positive. Test breakfast (refused). (2) Roentgen examination: Atonic ptosed stomach, three fingers' breadths below the crest of the ilium on left side. Cecal stasis and ptosis of the large intestine.

Summary.—Ptosis and atony of stomach and colon; gastric retention; fecal stasis.

CASE 28.—Girl, aged 19. Acne medium, duration two months. No gastro-intestinal symptoms. Bowels regular. (1) Gastric examination (refused). (2) Roentgen examination: Stomach slightly ptosed and atonic. Transverse colon kinked back and adherent to the cecum. Hepatic flexure prolapsed. Cecal stasis. Pylorus drawn slightly down into the right lower quadrant. Cecal and prepyloric region move *en masse*.

Summary.—Ptosis and atony of stomach. Cecal stasis. Right lower quadrant adhesions. Suggests chronic appendicitis. Fecal stasis.

CASE 29.—Boy, aged 17. Acne severe, duration one year. No gastro-intestinal symptoms. Bowels constipated. (1) Gastric examination: Fasting stomach: 10 c.c.; free hydrochloric acid positive; Hausmann's test and microscopic starch negative. Test breakfast: Free acid, 49; total acid, 79. (2) Roentgen examination: Stomach just to crest. Normal in size. Hyperperistalsis and motility. No cecal stasis. Transverse colon in good position. Spastic transverse colon.

Summary.—Hyperchlorhydria; spastic, transverse colon (suggesting mucous colitis).

CASE 30.—Boy, negro, aged 21. Acne medium, duration one year. Patient sometimes belches sour food after meals. Bowels constipated, except for past two weeks. (1) Gastric

examination: Fasting stomach; 5 c.c.; free hydrochloric acid present; Hausmann's test and microscopic starch positive. Test breakfast (refused). (2) Roentgen examination: Normal intestinal picture.

COMMENT

In an analysis of our cases, presented in the accompanying table, it is seen that those showing gastric abnormalities, 93 per cent., are somewhat greater in number than the ones showing intestinal abnormalities, 70 per cent. The most common gastric findings were hyperacidity, 48.1 per cent.; retention, 36.6 per cent.; atony, 33.3 per cent., and ptosis, 40.0 per cent. The most common intestinal findings were cecal stasis, 46.6 per cent.; ptosis of the colon, 36.6 per cent., and right lower quadrant adhesions, 23.3 per cent. Clinically, 63.3 per cent. of the cases gave evidence of gastric disturbances, and 40 per cent. of them were constipated.

It is rather striking that none of the cases examined gave entirely normal gastro-intestinal findings. These findings, however, in a few of the cases were of such mild degree or nature that they could not be considered as giving rise to any pathologic state.

Since the most important factors (as subacidity, gastric and intestinal ptosis, atony, adhesions and cecal stasis), which would probably predispose to acne, are those which permit gastric or intestinal retention followed by toxic absorption, we have therefore selected from our cases those which show these abnormalities to such a degree that a basis for toxic absorption can definitely be presumed to exist. There are twenty of

PRINCIPAL GASTRO-INTESTINAL FINDINGS IN ACNE VULGARIS

Case No.	Age	Sex	●	Degree*	Duration	Gastric Distur- bances, Clinical	Gastric Acidity				Gastric Secretion			Gastric Tone			Gastric Motility		Gastric Position		Intestinal Findings						Remarks	
							Normal	Hypacidity	Hyperacidity	Achylia	Normal	Hypersecretion	Retention	Orthotonic	Hypertonic	Atonic	Hypermotility	Hypomotility	Normal	Gastropno- sis	Constipation, Clinical	Cecal Stasis	Coloptosis	Atonic Colon	Spastic Colon	R. L. Q. Adhesions		Gastric Reflexes
1	15	M	A	6 mo.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Pyloro- spasm	Chronic appen- dix	
2	17	F	A	6 mo.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
3	20	F	A	5 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
4	20	F	A	6 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Mucous colitis		
5	18	F	A	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
6	15	M	A	2 mo.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
7	19	M	A	1 yr.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
8	21	F	S	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
9	16	F	S	1 yr.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
10	19	F	M	5 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Chronic appen- dix		
11	23	F	S	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
12	18	M	A	1 yr.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
13	21	M	A	5 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Chronic appen- dix		
14	15	M	A	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
15	19	M	A	3 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
16	13	M	A	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Chronic appen- dix		
17	14	M	M	6 mo.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
18	21	M	A	3 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
19	15	F	M	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Pyloro- spasm Pyloro- spasm	Chronic appen- dix	
20	21	F	M	8 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
21	21	F	M	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
22	18	M	S	3 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
23	20	F	S	5 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
24	18	M	A	2 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
25	25	F	M	3 yrs.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
26	20	F	A	1 yr.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
27	18	F	M	5 mo.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
28	19	F	A	1 yr.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
29	17	M	S	1 yr.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
30	21	M	A	1 yr.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Number.....						19	11	13	3	0	13	6	11	12	8	10	4	10	18	12	12	14	11	0	3	7		
Percentage.....						63.3	40.7	48.1	11.1	0	43.3	20.0	36.6	40.0	26.6	33.3	13.3	33.3	60.0	40.0	40.0	46.6	36.6	0	10.0	23.3		

* A signifies average; M, mild; S, severe.

† Test meal refused.

these cases, Nos. 1, 3, 4, 6, 8, 10, 11, 12, 14, 15, 17, 18, 19, 20, 22, 23, 25, 26, 27 and 28, which constitutes 60 per cent. of the total.

Our observations are too limited to draw any very definite conclusions as to the nature of the relations between acne vulgaris and gastro-intestinal abnormalities but we feel that our results show that the well established clinical observations as to the association of these conditions have, in many cases, a well-founded pathologic basis.

CONCLUSIONS

1. Acne vulgaris is generally conceded to be caused by the presence and growth of the acne bacillus.

2. There are a number of predisposing factors to this disease, one of the most important of which is gastro-intestinal derangements.

3. In a series of thirty cases of acne vulgaris, which were examined from the gastro-intestinal side, by test meals and fluoroscopic observations, we found that none of them gave absolutely normal findings, and that 60 per cent. of the cases showed abnormalities which were of such a nature as to permit gastric and intestinal stasis followed by toxic absorption.

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ABSTRACT OF DISCUSSION

DR. MICHAEL LEO RAVITCH, Louisville, Ky.: While the gastro-intestinal tract may have some influence as a causative factor in acne, I do not believe it is a very potent one. Judging from the fact that acne usually makes its appearance about puberty, I think the gastro-intestinal tract can be ruled out as a very important or primal factor. About this period of life glandular activity is very marked; but what causes this glandular hyperactivity we do not know. I have seen many cases of acne that failed to improve under various modifications of diet, no matter how strictly they have been followed.

DR. H. H. HAZEN, Washington, D. C.: From the results of this work we are justified in deducing at least one conclusion, namely, that stasis or other abnormal conditions of the gastro-intestinal tract are not such important factors in the causation of acne vulgaris as some writers would have us believe.

DR. WALTER J. HEIMANN, New York: Dr. H. J. Schwartz and I found hyperglycemia in 60 per cent. of the seborrheas, including acne. In a very large proportion of cases of acne there are gastro-intestinal disturbances, chiefly either hyperacidity or carbohydrate fermentation. It is possible that these may be associated with the disturbed sugar metabolism. Perhaps a combination of these ideas with those outlined by Drs. Ketron and King will ultimately lead us to an understanding of the underlying cause, if not to that of the local cause, which may be the acne bacillus.

DR. LLOYD W. KETRON, Baltimore: We have no claims to set forth. We simply wish to present the facts for what they are worth. It is probable that patients with eczema or some other skin diseases may show just as high a percentage of intestinal derangements as do acne cases. Our figures show that a large percentage of these patients suffer from intestinal stasis and retention, and under these conditions we would be more apt to meet with deranged protein metabolism.

Superstition.—In some parts of France there was formerly a custom of covering a newly born infant with salt in order to conduce to longevity; the salt was allowed to remain on for two or three days, and then was washed off with wine and water. The academician St. Aulaire was so treated as an infant, and undoubtedly lived to be very old. Pythagoras regarded honey as conducive to long life, and, according to Hufeland, the Egyptians prescribed courses of emetics with the same object.—Saundby.

New Instruments and Suggestions

USE OF CITRATED PLASMA IN TISSUE CULTURES

PRELIMINARY REPORT*

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The Burrows-Carrel method of cultivating tissue in coagulated plasma at body temperature¹ is already so well known that in describing a modification of it I shall merely touch on those points in the procedure which are affected thereby.

While the method gives almost perfect results in the laboratory in connection with animal experimentation, it unfortunately has its drawbacks when one wishes to apply it to work on the human subject in the hospital. In the first place, one must have a powerful centrifuge at hand, so that the blood may be centrifugalized without loss of time; otherwise it is apt to clot during the process. If the donor can come to the laboratory, this is easy; but if the blood is to be collected in a distant ward and brought to the laboratory, one often finds it clotted on removing it from the machine. The necessity of providing cracked ice or snow is often rather inconvenient, and the fact that this frequently melts almost completely during centrifugalizing makes it liable to spill into the tubes and contaminate their contents. Lastly, the necessity for paraffining and chilling all the glassware used during the preparation of the plasma is also more or less troublesome.

While one is working in a hospital it is not always easy to be on hand when a venesection is to be performed, nor is it always possible to be ready with cracked ice and paraffined glassware at such a time. On the other hand, as venesections are frequently done, or blood is obtained for Wassermann or other tests by the hospital staff, it occurred to me some time ago that it would be very easy for an intern to obtain such blood at any convenient time were it treated with some anticoagulant, such as sodium citrate, and set aside till wanted by the experimenter.

It has been shown that such blood can readily be re-coagulated at will by the addition of a solution containing calcium; and modern researches on transfusion have demonstrated the tolerance of the human organism for citrated blood. The conclusion is obvious: why not use citrated plasma for cell cultures, re-coagulating it on the coverslip by the addition of a calcium solution? To test out the feasibility of this idea, I began experimenting along these lines with perfectly satisfactory results, apparently in no way inferior to those obtained by the use of the original method.

The blood to be used is collected in tubes or flasks containing enough of a 0.2 or 0.3 per cent. solution of sodium citrate to make the total amount of the mixture contain one part of this to nine parts of blood. It may be drawn direct from the vein, through a cannula (preferably oiled), or into a syringe containing a sufficient quantity of the citrate solution, care being exercised to insure a thorough mixture of the blood with the citrate solution. The blood so collected is then centrifugalized for from ten to fifteen minutes in a powerful machine (the ordinary hand centrifuge is usually too slow for this work), and the resulting plasma decanted or pipetted into a flask which is then put away on ice, or in a cool place until wanted. I have always used paraffined flasks for this purpose, as the paraffin tends to prevent clotting. It will remain fluid and usable for a considerable time, a week or two at any rate.

The cultures are prepared in the usual way, a drop of the plasma being mixed on the coverslip with an equal amount of Ringer's or Locke's solution, the amount of calcium chlorid in these being increased ten times (from 0.025 to 0.25) in order to provide the excess of calcium necessary to overcome

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1. Abderhalden, E.: *Handbuch der biochemischen Arbeitsmethoden*, 1912, v, Pt. 2. Carrel, A., and Ingebrigtsen, R.: *Jour. Exper. Med.*, 1912, xv, 287.