evenly distributed among all ages, while the schizophrenics were commonest among the younger age groups. The remaining patients were suffering from a wide variety of psychiatric illnesses—for example, psychoses, alcoholism, psychopathic disorders, neurosyphilis, and organic diseases. Their admissions were

FIG. 4.—Time of admission of 114 patients with schizophrenia.

FIG. 5.—Age distribution of 78 patients admitted during menstruation.

evenly distributed throughout the menstrual cycle, and they tended to belong to the older age groups. It seems, therefore, that the disturbing influence of menstruation in the younger age groups is due to the predominance of schizophrenics among the younger patients.

Conclusion

This investigation into the time of admission of 276 psychiatric patients emphasizes the importance of menstruation and the premenstruum in relation to the onset of acute psychiatric episodes by revealing that 46% of all admissions occurred during this time. Indeed, 53% of attempted suicides, 47% of patients with

depression, and 47% of schizophrenic patients were admitted during menstruation or the premenstruum.

The significance of these figures lies in the immediate prognostic value; for patients who first seek psychiatric help in the premenstruum may be expected to become worse up to the third or fourth day of the menstrual cycle. Nor should it be forgotten that premenstrual tension can be successfully treated, and this applies whether premenstrual tension occurs alone or in combination with other psychiatric illnesses and regardless of whether the hormonal changes of menstruation are causative or merely acting as a trigger in the onset of an acute psychiatric episode. Hormone therapy is not contraindicated by other psychiatric treatment.

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ATONY OF THE FEMALE BLADDER

REPORT OF FOUR CASES

BY

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Most cases of bladder distension fall into one or other of the three standard classifications—that is, of mechanical, congenital, or neurogenic origin.

A certain number of cases of insidious distension of the bladder in the female are seen, however, in which atony of the bladder itself seems to be the primary factor, and in these cases no obvious mechanical obstruction, congenital malformation, or neurological disorder is to be found. It is because of the obscure cause of this atony, and because so little literature is to be found on the subject, that the following four cases, all occurring in females, are recorded and the sparse literature is reviewed.

Case 1

A married woman aged 57 first presented at hospital in 1952 with an attack of pyelocystitis. She had never at any time experienced any difficulty with micturition and thought she had always passed a normal quantity of urine.

On examination there was a large mass in the abdomen, reaching to the xiphisternum, which was cystic with a well-marked fluid thrill. The blood urea was 28 mg. per 100 ml., and urine examination showed pus cells and scanty *Escherichia coli*. Her blood pressure was 140/80.

A provisional diagnosis of large ovarian cyst was made, and the patient prepared for laparotomy. In view of the vague urinary symptoms, the possibility of the mass being distended bladder was considered, and a preliminary catheterization was performed in the theatre. This failed to empty the swelling, owing, as it was afterwards proved, to distortion of the urethra and bladder neck from pressure.

On opening the abdomen a huge bladder was found. This was incised and a large quantity of urine evacuated, together with several vesical calculi. The bladder was closed in two layers, and two weeks later the wound was soundly healed. At this stage an intravenous pyelogram showed perfectly normal kidneys and ureters, with no evidence of hydronephrosis.

Full cystometric examination of the bladder revealed: (1) that the bladder initially contained 88 oz. (2,500 ml.) of urine; (2) that the bladder had to be filled to the extent of 100 oz. (2,840 ml.) before the patient got any sensation of fullness, and with this amount in the bladder a pressure of only 26 cm. of water was recorded on the manometer; and (3) that this pressure could be increased to 100 cm. of water by voluntary contraction of the abdominal muscles.

Operation.—This was performed in August, 1953, by Mr. J. S. Ramage. A diathermy excision of the bladder neck (which was macroscopically and microscopically normal) was carried out, and about two-thirds of the redundant bladder wall was resected. The bladder was closed without drainage, and a rapid recovery with primary healing of the bladder occurred.

Several estimations of the residual urine have been made since operation, and it has varied between 7 and 10 oz. (200 and 280 ml.). It appears to be static in amount, and is not infected.

Histology of Resected Bladder.—Chronic inflammation was evident below the epithelial lining and in the deeper layers, and oedema and increased fibrous tissue were present around the smooth muscle bundles. No nerve ganglion cells were seen, but the nerve fibres were normal in number (Figs. 1 and 2). This apparently is the typical histological picture of the resected bladder in cases of primary atony.

FIG. 1.—Low-power view of resected bladder (Case 1), showing chronic inflammation below the epithelial lining and increased fibrous tissue round the smooth-muscle bundles.

FIG. 2.—High-power view of part of section shown in Fig. 1. This emphasizes the fibrous tissue around the smooth-muscle bundles, the degeneration of smooth-muscle fibres, and shows the absence of nerve-ganglion cells. Nerve fibres, however, are normal in number.

Case 2

A married woman aged 66 was admitted to hospital in October, 1951, with a large inflammatory mass in the left iliac fossa. At operation this proved to be a paracolic abscess secondary to sigmoid diverticulitis, and was treated first by drainage and transverse colostomy and later by resection of the colon. It was whilst in hospital that this patient was first noticed to have a symptomless but palpable bladder, and on one occasion she passed 80 oz. (2,275 ml.) of urine quite spontaneously.

On cystoscopy the instrument went in easily, and the bladder wall was seen to be thrown into many large smooth folds. The blood urea was 38 mg. per 100 ml., and pyelography showed normal kidneys with no evidence of hydronephrosis. Her blood pressure was 120/80.

As she was quite comfortable, and in view of the previous major surgical procedures, she declined any operative treatment on her bladder. No opportunity for cystometry presented itself in this case.

Case 3

A married woman aged 65 was first seen in early 1953 because of some urinary incontinence and swelling of the abdomen. She was found on examination to have a palpable bladder well above the umbilicus. After admission to hospital she had to be catheterized every day, and 40–50 oz. (1,135–1,420 ml.) of urine was withdrawn on each occasion. The patient stated that her mother had similar urinary trouble, and in later life had to be catheterized every

day. She was seen by a psychiatrist, who could find no mental abnormality or evidence of neurological disease.

Cystoscopy showed absence of a feeling of fullness of the bladder until it contained 60 oz. (1,700 ml.) of fluid, and at this point the intravesical pressure was only 25 cm. of water. Pyelography again showed normal kidneys, and the blood urea was 32 mg. per 100 ml. Her blood pressure was 130/85. She declined operative treatment on her bladder, and was quite happy for the district nurse to catheterize her periodically.

Case 4

A spinster aged 63 was first admitted to hospital in 1948 with abdominal pain and a large cystic lower abdominal swelling. She was thought to have a twisted ovarian cyst, and a laparotomy was performed by the resident surgical officer. The swelling proved to be a huge bladder, and the abdomen was closed after catheterization and withdrawing 75 oz. (2,130 ml.) of urine. The patient, an ex-nurse, admitted no previous urinary difficulties, but did admit the ability to go all day without passing urine and then to pass a large quantity. Pyelography showed normal kidneys, and the blood urea was 40 mg. per 100 ml. Her blood pressure was 135/80. Cystoscopic findings were as in the other three cases, with no evidence of obstruction of the bladder neck but large smooth folds of bladder wall. It was necessary to put 65 oz. (1,845 ml.) of urine into the bladder before she experienced any feeling of fullness, and this amount showed a pressure of only 24 cm. of water. Voluntary contraction of the abdominal muscles increased this to 95 cm.

The patient declined partial cystectomy, and, as she was an ex-nurse, was quite content to catheterize herself when necessary.

Anatomy

The nerve supply of the bladder is derived from both branches of the autonomic nervous system. The sympathetic innervation is from the thoraco-lumbar outflow and constitutes the presacral or hypogastric nerve. It is now felt that the sympathetic innervation has little to do with the control of micturition, but it contains some sensory fibres mediating pain and temperature, and also exercises some vascular control on the vessels of the bladder wall.

The parasympathetic nerve supply (pelvic nerves or *nervi erigentes*) is from the sacral outflow, and its pre-ganglionic fibres make their synaptic connexions with the visceral ganglion of the bladder. It is generally agreed that the parasympathetic nerves are the motor nerves of the bladder. Stimulation of the pelvic nerve or the sacral segments of the cord causes contraction of the bladder and the evacuation of urine.

Review of the Literature

The first real reference to the atonic bladder and its treatment by subtotal cystectomy seems to be that of Orr (1937), who described a case which he first presented at the meeting of the Southern American Medical Association in 1936.

Nothing further appeared in the literature until 1948, when Crabtree and Muellner published eight cases of atonic bladder successfully treated by removal of two-thirds of the organ. Apparently Crabtree had performed one such operation as early as 1937.

Fish (1950) reported the cases of four male patients in whom subtotal cystectomy alone or in combination with prostatectomy was performed for the chronically dilated bladder. He also pointed out the absence of dilatation of the kidneys in his cases and the presence of a normal blood pressure and blood chemistry. Houtappel (1952) reported 13 cases of bladder atony, all but one of which

were male. In his female case he first of all carried out transurethral resection of the bladder neck, which had only a slight effect on the residual urine, but considerable benefit was found after removal of two-thirds of the distended bladder. This case suggests that the primary pathology may be in the bladder itself.

Discussion

It is suggested that there are two types of bladder atony, the myogenic and the neurogenic, or possibly a combination of the two, in which some muscle as well as nerve degeneration takes place in the bladder wall.

Crabtree and Muellner, and later Houtappel, found, as we did in Case 1, that an increase in fibrous tissue around the smooth-muscle bundles is absolutely characteristic of the histology of the resected bladder wall. The absence of nerve-ganglion cells also seen in Case 1 may be of significance here.

The theory is advanced that there is either a nerve degeneration or a muscle degeneration in the bladder wall in these cases, and that atony and distension occur simultaneously so that no renal back-pressure effects are seen. In our experience the condition is predominantly found in females; most of the male cases reported have had either prostatism or some organic obstructive lesion. We have, in fact, experience of one male patient, aged 54, whose bladder contained on occasion as much as 80 oz. (2,275 ml.) of urine, but who micturated quite normally and could be catheterized easily. The absence of full investigations in this case, however, precludes its inclusion with confidence in the present series.

It is generally agreed that the ideal treatment in these cases, after careful exclusion of any of the common factors causing bladder distension, is subtotal cystectomy, removing two-thirds or three-quarters of the redundant bladder wall. Transurethral resection of the bladder neck by itself has no effect on the residual urine. There appears to be some chance of the residual urine increasing slightly in amount after partial cystectomy.

Summary and Conclusions

Four female cases of a hitherto neglected condition—primary atony of the urinary bladder—are described. Most of the sparse literature on the subject is quoted.

The classical clinical picture of the condition is a palpable distended bladder with large residual urine and often little in the way of symptoms except occasionally frequency. The patient really has an overflow retention. On cystoscopy no obstruction of the bladder neck is to be found, and a bladder wall thrown into numerous smooth folds is typical. The absence of hydronephrosis or hydro-ureter on pyelography and the absence of disturbance of blood chemistry or blood pressure are also constant features.

Subtotal cystectomy is the treatment of choice, and this was done in one case, but no great harm appears to result if the condition is left in the older patients, as no progressive renal damage is likely to occur. Cystometric findings are also characteristic in these cases.

There is no obvious reason why a comparable condition should not occur in the male.

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TREATMENT OF CHRONIC NON-SPECIFIC DIARRHOEA A CLINICAL COMPARISON

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There are a number of persons who suffer perennially from chronic non-specific diarrhoea. The aetiology in these cases is no doubt diverse, but they are similar in that they form a symptomatic group in which no organic lesion can be discovered. Various forms of symptomatic relief are attempted, among which the use of a derivative of opium or one of the various antispasmodics on the market are popular at present. It seemed important that a clinical comparison should be made of the effectiveness of such treatment.

The selection of an antispasmodic was difficult, for there is no comparative study of the effectiveness of the many preparations available. Tricyclamol has been shown to be effective in decreasing gastric motility in balloon motility studies (Anderson 1955) and also in barium studies (Aylett and Douthwaite, 1955). Claims have also been made for its effectiveness in the control of "hypercholinergic" bowel symptoms (Schwartz *et al.*, 1955). However, the final selection of tricyclamol was arbitrary and was made largely on the ground that a supply was readily available. It is believed, however, that it may be representative of the group of antispasmodics. For comparison, codeine was selected because it has been used for many years in the treatment of diarrhoeal states and has been found effective in the hands of many clinicians. Codeine was used in a dosage of 30 mg. t.i.d. and tricyclamol in a dosage of 50 mg. t.i.d.

Material and Method

Selection of Subjects.—The subjects for the trial were patients attending the routine hospital out-patient department. All of them had bowel symptoms for at least six months prior to the commencement of the study. Immediately preceding admission to the trial all had at least 14 bowel actions a week, with loose or watery motions, often associated with abdominal discomfort. Examination by barium meal, barium enema, and sigmoidoscopy was negative in all cases. In

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