THE THERAPEUTIC AND PHYSIOLOGICAL ACTION OF DIGITALIS.

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Few drugs have been the subject of more conflicting statements than digitalis, and yet there are none on whose action the Profession has more implicitly relied. The drug has a special action on three separate organs—the brain, the kidneys, and the heart; in proof of this, witness its decided action in delirium tremens, in dropsy, and in various forms of heart disease.

As the action of the medicine upon this latter organ seems to have been little understood, and is still scarcely established, although the observations of Dr. Handfield Jones and others have been well put forth, it therefore seems right to add any new facts or observations on the subject.

I have carefully observed from twenty to thirty cases of cardiac disease treated by digitalis, from which the following conclusions have been drawn; some of these will be quoted as very decided cases, showing the true action of the medicine. As the proposed explanation of the action of digitalis accords fully with the ingenious and well-supported theory put forth by Dr. Anstie in his work on "Stimulants and Narcotics," it may be well to say that he holds that all true stimulants tend to bring tissue action to its normal standard; that when such action is in excess a true stimulant will reduce it, and when below par will bring it to its proper level; he proposes "that the word stimulant be restricted to agents which, by their direct action, tend to rectify some deficient or too redundant natural action or tendency." I believe that the action of digitalis when properly investigated will confirm these views; and at the same time the investigation of its action will be materially assisted by bearing them in mind. I shall show—

1st. That digitalis will stimulate and strengthen a weak heart, and that the weaker the muscular tissue of the heart the safer will be the administration of the medicine.

2d. That in a hypertrophied heart it will fail to reduce the pulse either in frequency or strength, and in such cases will prove dangerous.

3d. That in a weak organ, acting because of its weakness with great rapidity, it will reduce the number of its contractions, and, as it were, strengthen or tone them down. To strengthen and quicken the action of a weak, slowly-acting heart, and to reduce the number of the rapid strokes of a feeble heart is, according to Dr. Anstie, to do the work of a true stimulant, bringing action up to the normal standard on the one hand, and reducing it to that level on the other.

I. The following case is one of many in which the remedy has removed irregularity and intermission of the pulse, has given power to the heart when exceedingly weak, and increased the rapidity of its action.

A lady, aged 50, had suffered for nine years from cardiac disease, and was in an extremity of suffering when I first saw her, having a very largely dilated and weak heart whose cavities were overladen with blood, and considerable disease of both aortic and mitral valves. A confused tumbling and heaving impulse was all that could be felt in the cardiac region, and feeble blowing murmurs supplanted the natural sounds of the organ. There was no pulse at the wrist, and the large vessels in the limbs had scarcely a pulsation in them.

A dropsy of the legs and belly was making fast progress, and the usual stimulants and diuretics had failed to give relief. Although thus pulseless and faint, with the heart in so weak and burthened a condition, I prescribed digitalis in doses of ten drops and upwards. In a day or two the organ began to beat more forcibly, the pulse came again at the wrist, the turbulent or confused action became replaced by a quiet, steady stroke, the breathing, before labored, became easy, and the dropsy began to disappear. In a week the patient was out of bed, and very shortly she so far recovered as to go about in her usual way. After this she lived for more than a year in comparative comfort and good health, when suddenly the organ again failed, and before digitalis could be administered she died.

I might add to this cases of aortic regurgitation, with dropsy; many cases in which both aortic and mitral orifices were diseased, with dilatation of the walls of the heart and a weak, irregular pulse at the wrist; cases of simple weakness of the organ, without appreciable disease; cases of dyspnoea from an emphysematous state of the lungs and sluggish pulmonary circulation—all of which were most decidedly benefited by digitalis. I would especially direct the attention of the profession to the use of the drug in cases of bronchitis depending on sluggish circulation, with weakness of the heart's action and emphysema of the lung.

I have alternated the use of digitalis with the strongest of our stimulants in some of these cases, and have been astonished at the superiority it possesses as a stimulant. From the observation of a few cases in which the drug has been given continuously for a lengthened period, I do not find anything like failure of the heart's action to occur under a month or six weeks, and then a few days of intermission will clear the way for a fresh course of the medicine. In dyspnoea the relief obtained is sometimes most marked. I remember a poor girl, with frightful disease of the mitral orifice, having to rest on almost every doorstep on her way to my house, who was so relieved by digitalis as to walk to and fro with ease. I do not think, after trying it in almost all the affections of the heart, that there is a single disease or condition of that organ attended by weakness in which it may not be given with safety and benefit.

II. The next condition to which I would refer is that of hypertrophy. In this my experience is not large; but in one uncompli-

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cated case of hypertrophy of the left ventricle, without valvular disease, in a man who had an almost Herculean frame, digitalis was fairly and carefully tried. The heart's action in this case was rapid and at the same time very forcible; the digitalis not only failed to reduce this, but it caused an increase in the symptoms, and the patient almost fainted after trying it for one week, so that the medicine had to be changed to tinct. verat. virid., from which decided benefit was derived. I might say that a converse experiment was tried in a boy, with mitral disease and rapid action of the heart. Here tinct. veratr. virid. failed to give the relief which was most effectually derived from digitalis.

III. Lastly, as a cardiac stimulant, digitalis ought to reduce too great rapidity of action *when this depends on weakness*. In this respect the drug has been well tried, and almost universal testimony to its value has been given.

In inflammatory diseases, in fevers, in phthisis, it is acknowledged to reduce the rapid pulse. In one case of phthisis at present under my care, it does this, and most materially lowers the temperature of the body and relieves the daily hectic paroxysm. While, however, it checks the excessive rapidity of the heart's action, it does not, therefore, weaken its force; so that, as a true stimulant, it brings the organ down to a slower rate of action, but at the same time affords it more power to do its work.

Thus it appears that the *physiological* action of digitalis is that of a stimulant, in Dr. Anstie's sense of that term; and that in its *therapeutic* properties it is especially useful in cardiac weakness, whether that weakness be accompanied by extremely slow or extremely rapid action. Further, its physiological action as a stimulant may be explained by supposing that in the case of the slow heart it improves the molecular arrangement of the sarcous elements, or that it excites the nerve centres from which the nervous power of the heart is derived; and in the case of the weak but rapid heart, it acts by strengthening that regulating or restraining (vital) influence which, while maintaining the activity of the tissues at a normal rate, checks undue and riotous action in the same (Radcliffe). Lastly, let me say that as a diuretic it is at once the safest and best we possess, and the dose may vary from ten drops to half an ounce. This very day I have given nearly half an ounce in fifteen-drop doses every two hours to a child three years old, and by so doing have subdued a rapidly-developing general dropsy, which was threatening the little sufferer's life.

P. S.—In some cases of mitral regurgitation, accompanied by a loud, distinct murmur, I have felt satisfied that digitalis reduced the intensity of the murmur most decidedly, and in one case it seemed to disappear altogether.—*London Medical Times and Gazette.*