The very first argument is already baffling to me.

> In scientific studies, in order to get reasonable statistical strength, you need at least 20 participants for each group.
>
> Applying this here would mean that the control group should be at least 20 matches

Just because 20 participants might be needed in certain non-backgammon-related studies doesn't mean the same applies to backgammon. This reasoning is entirely arbitrary and lacks any scientific basis.

Just as an extreme (maybe bit stupid) example, imagine a complete beginner who's been playing for a few days performing 1x or 2x in a fairly long match with good number of challenging checker and cube decisions. Even if it's just 1 match, it would still be such an incredibly unlikely occurrence for player of that level and probably enough to conclude that cheating took place.
One match consisting of let's say 10 games can have 200+ moves, not to mention plenty of cube decisions as well. So playing well in this 1 match requires making many strong decisions. I'm sure even the person suggesting 20 match sample would agree that this is impossible for a beginner.

Obviously, Anna Sofia is not a beginner, but her level (both online and live) is not better than 8x PR average. As we know, PR has a natural variance to it. Sometimes we'll play lot better, sometimes lot worse than our average. But there are limits as to what is realistically possible for a player of a particular level.
As 5POINT report nicely shows:
'From 5POINT's database, there are 28 472 matches from players with a PR of 8,74+ and in 50 of these the player has achieved a PR under 3,11. These are most often very short matches where the intermediate player was lucky to have few decisions'

So the probability of someone as strong as Anna Sofia to perform under 3,11 is mere 0,18%. In just 1 match! The chance of this repeating multiple times in a row is also given in 5POINT report and it's so low that really you don't need anywhere close to 20 matches to conclude that the cheating took place.
For a beginner even 1 match will be enough, for an intermediate level player like Anna Sofia, couple of matches will probably be enough and certainly 5 long and reasonably difficult matches is MORE than enough to reach statistical significance.

Now of course, had Anna Sofia played at let's say 6x PR level (which would also be significant better than her average) it's unlikely that 5 matches would be enough and certainly bigger sample would be required. Each case is different.
Here we're talking about extreme improvement where an intermediate player suddenly plays better than most grandmasters in the world. In this specific instance, 5 matches is plenty enough.

The theory of 'rapid improvement' that has also been mentioned simply doesn't hold true in this game. Backgammon is like a puzzle consisting of hundreds of pieces of knowledge.

Each match challenges you in many of these aspects. Certainly, you can improve in SOME aspects of the game very rapidly (for example you learn basic race formula very easily or some useful 'rules of thumb') but for your average PR to see a significant drop requires a lot more time and lot more topics learned, applied and fully understood.

Also it should be noted that all of Anna Sofia's observed live and online matches were fairly recent. The sample I looked at from your live matches website is from June to October of 2024. As an example, some of her most recent very weak matches include: 12,30 PR match (21pt) from 04.08., 8,40 PR match (21pt) from 31.08. and 8,17 PR match (17pt) from 05.09. I think this is as recent as it gets.
Having gone through of all those matches and seen the kind of mistakes that have been made I'd say there is a LOT of work and time required to trim that average PR even by 1, let alone suddenly performing at an elite World Class level.
If she can improve her average PR from 8,6-8,7 to let's say 6x within a YEAR of hard work I'd be very impressed. Certainly, we can't seriously talk about someone mastering the game in mere 2 months or so from when these last couple of live matches have been played.

As for BMAB requiring 300 experience to get the title, now this is an entirely different topic and once again nothing to do with cheating investigation.
BMAB requires certain very specific PR thresholds in order to get the title. For example to become a Grandmaster you need to play below 4 PR. BMAB wants to ensure that those who become a GM are indeed playing that level in the long run as well and have not just luckboxed it.
For example, you could be a 4,5 PR player longterm but if you get bit lucky certainly you could perform at 3,8 or 3,9 PR over some number or matches. That's why 300 exp is required to minimise the effect of natural PR variance.
I think this is self-evident to even talk about, but when analysing potential cheating cases we don't really need the level of precision that BMAB requires. We are not investigating whether Anna Sofia's average PR is 8,7 or 8,9 or 8,4 precisely, we are investigating whether a player of that level (8+) can perform the way she performed in her online tournament matches. And it's clear that this is not the case.

Mislav Kovacic