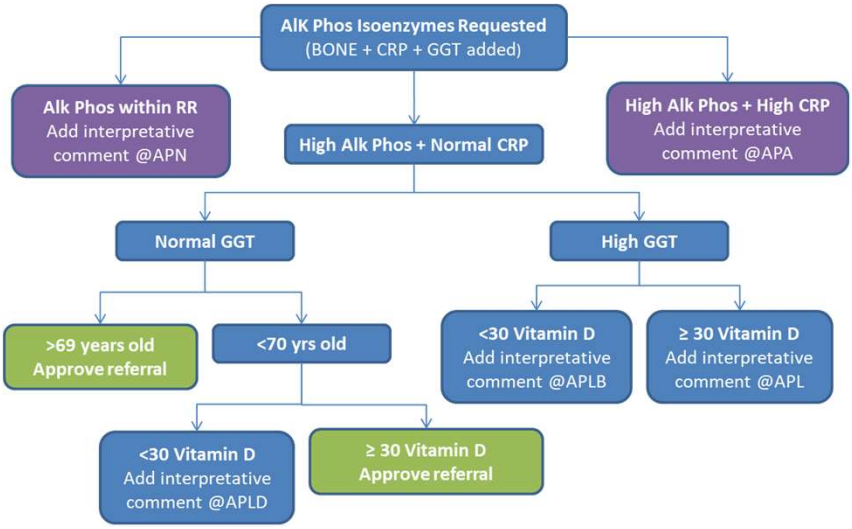
An audit on the impact of a new vetting and reporting protocol on the referral of Alkaline Phosphatase Isoenzymes requests.

Miss Anna L Barton. Department of Clinical Chemistry, Royal Cornwall Hospital, Truro, Cornwall

Introduction

In 2015 our alkaline phosphatase isoenzymes (API) service ceased and turn-around-times increased as samples were referred away for analysis by electrophoresis. In-house analysis had been performed on a weekly basis, with a very basic vetting system of checking the alkaline phosphatase (ALP) concentration was high enough for the assay, and the CRP was within the reference range. Due to the referred analysis having a longer turn around time it was important that only the most appropriate samples were sent away. There was a need for a better protocol using quick in-house tests to aid vetting of API requests. As well as improved reporting of requests not referred using standardised comments based on the inhouse results. This was hindered by a lack of best practice guidance.



We adapted a protocol published in the Annals of Clinical Biochemistry (2019) to include first-line testing of ALP, CRP, GGT and Vitamin D. Furthermore our Pathology computer system was amended so when an API was requested a bone profile, CRP and GGT would be automatically added. This reduced the frustration of not having a current ALP to hand and stop delays from having to add on GGT/CRP, thus further streamlining our system. Only vitamin D is manually added. From August 2019 our new vetting protocol went live (see above flow diagram), and samples not sent away for analysis were reported using newly created coded comments. Samples meeting the referral criteria of either being from an under 5 year old, oncology or trial patient, or likely malignancy, or as per the vetting protocol (above) were referred as normal.

Aim

To see how a new vetting protocol has affected Alkaline Phosphatase Isoenzymes (API) referrals and reporting.

Method

Two 12-month data pulls were made from the Pathology computer system for API requests July 2018 to June 2019, and September 2019 to August 2020. Results for ALP, CRP, GGT and Vitamin D requests made on the same sample number were also downloaded, and when missing this information was found manually looking at historical results. The API reports were looked at and grouped according to the results; the ALP, CRP, GGT and Vitamin D results were also examined. The APIs requests from the second data pull (2019-2020) were also checked to see if the protocol had been correctly followed.

Results

Pre-protocol there were 161 API requests with 75 (46.6%) rejected for referral, with 30.7% having a high CRP, 26.7% an ALP within the reference range and 20.0% only having a mildly raised ALP. Those that were referred were predominantly bone (40.7%), liver (18.6%), liver & bone (17.4%) or intestinal (7.0%) in origin.

Post-protocol there were 116 API requests with 76 (65.5%) rejected for referral, with 22.4% having a high CRP, 25.0% a high GGT with adequate Vitamin D and 22.4% an ALP within the reference range (Table 1). Of the referred samples predominantly bone accounted for the majority (57.5%) of results, though we also had a high percentage (12.5%) of bone & intestinal (see table right). Turn-around-times for APIs not referred remained under 2 days, and for those that were changed from 22 to 17 days. All requests not referred and 82.5% that were referred adhered to the API protocol.

Table 1: A breakdown of API results from Sept 2019 to Aug 2020.

APIs reported using in-house tests only		
In-house Results	**Number**	**Percentage**
Normal ALP	**17**	**22.4**
Mildly Raised (but too low)	4	5.3
High CRP	**24**	**31.6**
High GGT + Adequate VitD	**19**	**25.0**
High GGT + Deficient VitD	4	5.3
Normal GGT + Deficient VitD	2	2.6
Repeat	3	3.9
Insuff	2	2.6
Haemolysed	1	1.3
Total not referred (vs all APIs)	**76**	**65.5%**

APIs sent to referral laboratory		
Referred APIs Results	**Number**	**Percentage**
Pred Bone	**23**	**57.5**
Pred Liver	**6**	**15.0**
Pred Liver & Bone	2	5.0
Pred Liver & Biliary	2	5.0
Pred Bone & Intestinal	**5**	**12.5**
Pred Liver & Intestinal	1	2.5
Pred Intestinal	1	2.5
Total referred analysis (vs all APIs)	**40**	**34.5%**

Discussion

The new protocol decreased the percentage of API requests referred for electrophoresis, from 54.4% to 34.5%. Using the pre-protocol (pre-COVID) numbers a modest saving of approximately £2,000/year. The major benefit is that consequently 65.5% of APIs are now reported within 2 days using in-house tests and standardised interpretative comments. Previously the majority of these samples would have been referred for analysis delaying the clinician finding the cause for their patient's high ALP. The protocol was easy to follow with 82.5% of referred APIs adhering to the protocol. Inappropriate referrals were on two samples with high CRP, and five with high GGT, the latter was likely confusion due gender difference in reference ranges.